OPTEX

Universal Transmitter
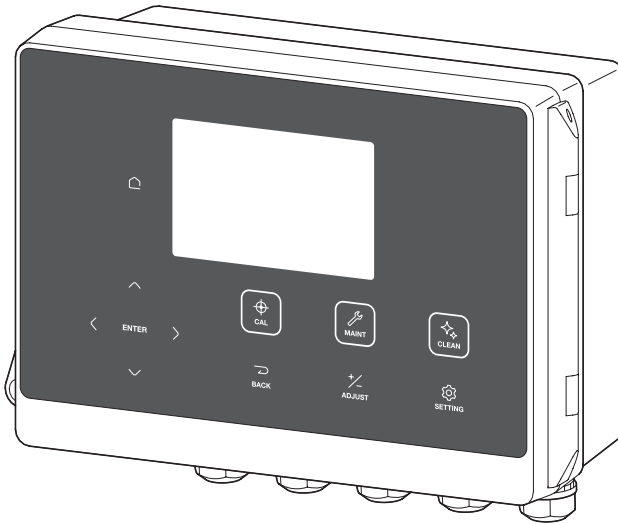
WATER it

SC-U1(E)

Operation Manual

Thank you very much for purchasing the Universal Transmitter SC-U1.
All of this instruction manual must be read before operation of the Universal Transmitter SC-U1 for safe and proper operation.
This instruction manual should be kept for future reference such as maintenance.

The instruction manual is also available on the following website.
https://navi.optex.net/manual/05324

Features (what this product can do)

This Universal Transmitter SC-U1 is a signal converter that displays the measurement value of the sensor, converts the sensor signal into an analog signal and outputs it to an external recorder, or outputs a relay contact signal to an external control panel when the sensor signal exceeds the alarm trigger.
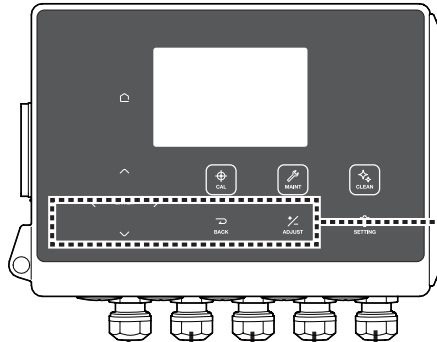
Input
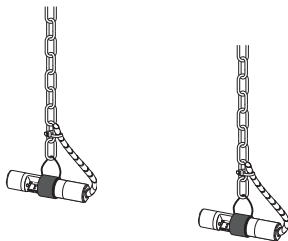
Two sensors can be installed.
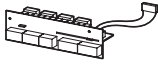
Output

4-20 mA output
The measurement value can be output at 4-20 mA.
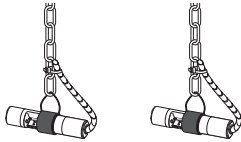2 channels can be output.

Relay output
The alarm level can be set and the contact output can be activated when the measurement value exceeds the trigger.
The relay output can be assigned to Self Checking and maintenance output as well.
4 channels can be output.

Option

Sensor Input Expansion/ Output Expansion Board SC-U-EB

The number of sensors that can be input, the 4-20 mA output that can be output, and the number of relay output channels can be increased.

Up to 2 more sensors can be installed.

4-20 mA output
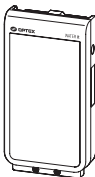Up to 2 more channels can be installed.

Relay output
Up to 4 more channels can be installed.

Configuration	Sensor	4-20 mA output	Relay output
SC-U1 only	2 channels	2 channels	4 channels
SC-U1 and SC-U-EB	4 channels	4 channels	8 channels

The number of channels shown in the table is the maximum number that can be installed.
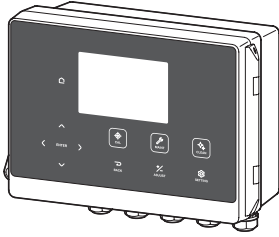
Gateway

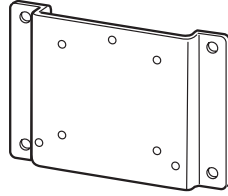Measurement values can be uploaded to a cloud server by wireless communication.
Measurement values can be monitored from a remote place.
Notifications can be sent by e-mail for error and maintenance information.
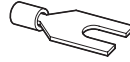
List of contents

SC-U1 main unit: 1

Transmitter mounting bracket: 1

Power supply
Y terminal (M3): 2

Grounding
Y terminal (M4): 1

Cover fixing screw
and nut (M5): 1

Transmitter mounting screw
(M5 x 10): 2

Instruction Manual

Operation manual (this document): 1

Installation manual : 1

If there are any missing or faulty items, please contact our sales representative.

Table of Contents

Items referred to ⟨Sensor⟩

The settings and operations differ depending on the sensor you installed.
For details, Refer to each sensor's instruction manual.

Items referred to Sensor

The settings and operations differ depending on the sensor you installed.
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Items referred to `Sensor`

The settings and operations differ depending on the sensor you installed.

For details, Refer to each sensor's instruction manual.

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1 For Safe Use

Be sure to read this instruction manual in order to use the Universal Transmitter SC-U1 properly.

- Please thoroughly read the "For Safe Use" before using the Universal Transmitter SC-U1 properly.
- Because these precautions are related to failure or malfunction, observe the precautions for use without fail.

> ⚠ **The SC-U1 is designed specifically for OPTEX sensors.**
> **Do not connect any other equipment to the sensor input.**

🚫 denotes "Prohibited action" and ❗ denotes "Required action".

To prevent fire, electric shock, and/or failure	
❗ **Be sure to use a power supply of 100 to 240 VAC. Using the product with an AC voltage other than 100 to 240 VAC may cause fire or electric shock.**	❗ **Close the cover securely.** For how to close the cover, refer to "How to open/close cover" P.12.
❗ **Turn off the power immediately in the unlikely event that there occur any abnormalities such as smoke or abnormal noise. Otherwise it may cause fire or electric shock.**	❗ **Keep the power off during installation and wiring operations.** There are high voltage parts inside the Transmitter. For installation and wiring, turn off the power switch and disconnect the power cable from the power supply source. Failure to do so may result in fire or electric shock. OFF
🚫 **Do not disassemble or modify the Transmitter. The Transmitter contains high voltage parts that may cause the outbreak of fire or electric shocks. Contact your dealer for internal inspections, maintenance and repairs.**	🚫 **Do not press 🧹 CLEAN when the sensor with wiper is in air.** It may cause the sensor to malfunction. When using a cleaning device other than the one provided with the sensor, follow the instruction manual of the cleaning device.
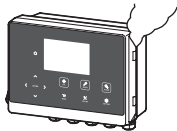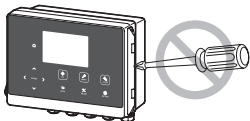
8

Do not apply strong shock or excessive force to the Transmitter.	To clean the Transmitter, gently wipe it with a clean, soft cloth containing diluted neutral detergent, and then wipe off moisture with a dry clean soft cloth. Do not wipe with an organic solvent. It may cause failure.
It may cause failure.	
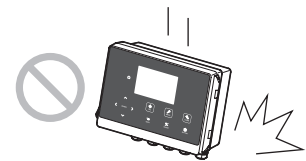
To acquire proper measurement values

Do not install in places exposed to direct sunlight or poorly ventilated areas.	Use the included transmitter mounting bracket for installation.
Use the supplied cable gland for the Transmitter. When connecting piping directly to the Transmitter, take measures to prevent corrosive gas such as chlorine gas from entering the Transmitter through piping.	Do not bind the signal output cable and the power cable together or place them in the same cable gland.
Do not touch electrical parts or the board.	Remove the protective film from the display before use.
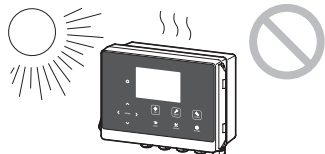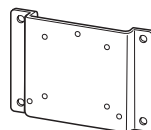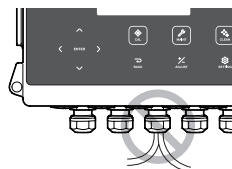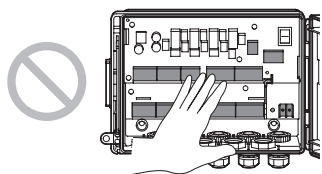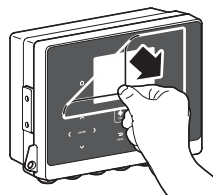
Unit only suitable installed in control panel.

2 Component Name

Front view

Display

Lock lever

Operation panel
(cover)

Cover fixing
screw hole /
key hook

Cable gland

Inside the cover

Terminal block for
gateway connection

Connector for SC-U-EB

Power supply
switch

ON

OFF

Terminal block
(shown below)
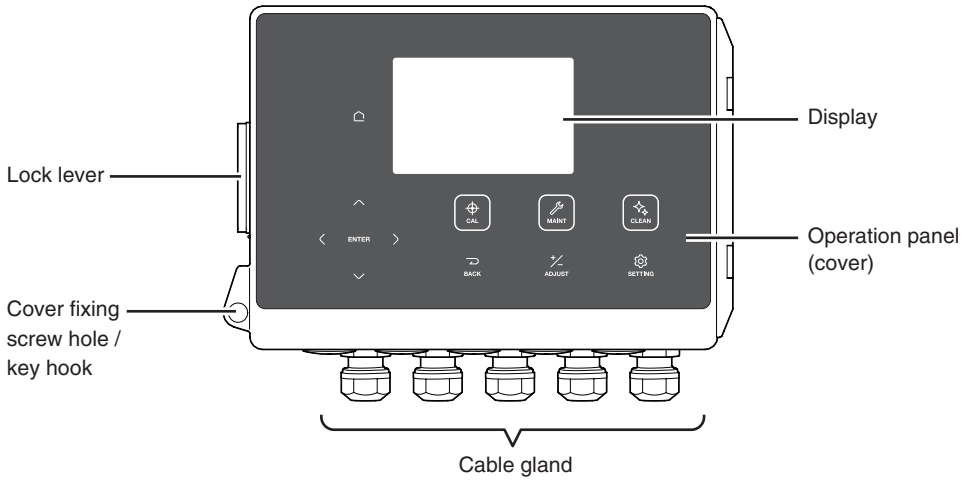
Power supply
(shown below)
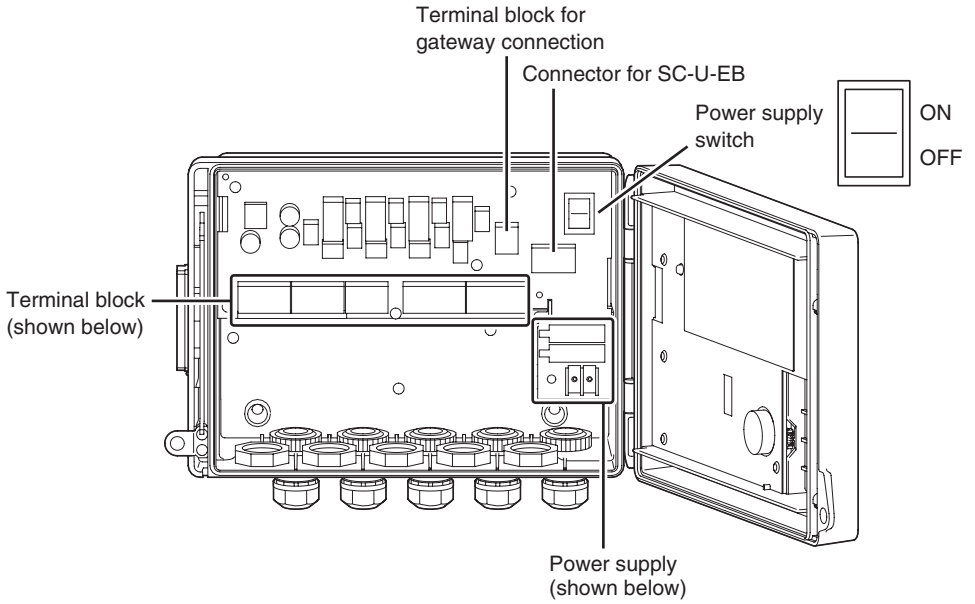
Caution	Do not touch the terminal blocks and cables connected to the terminal blocks. A cable may come off, resulting in abnormal operation.

Terminal block

Terminal block

Sensor		4-20mA output	Relay output	
ch1	ch2	ch1	ch2	ch1	ch2	ch3	ch4

Sensor		4-20mA output	Relay output	
ch3	ch4	ch3	ch4	ch5	ch6	ch7	ch8
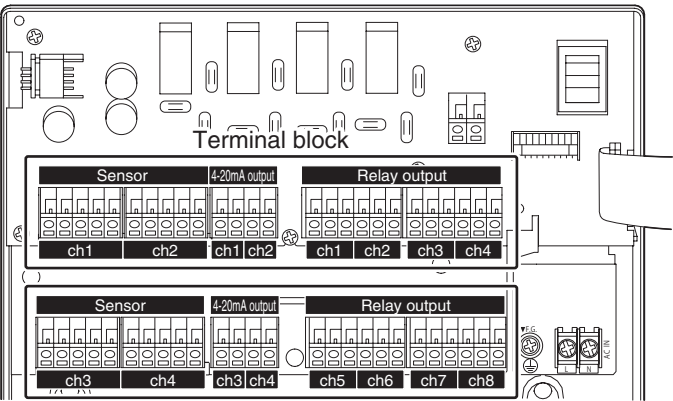
Terminal block (SC-U-EB) * Optional

Power supply

Breaker

▼F.G.

AC IN

L   N

Ground
terminal

Power supply
terminal block

11
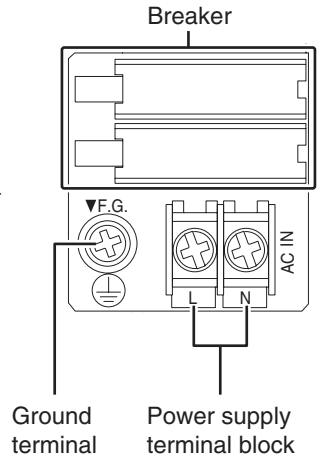
◆ **How to open/close cover**

To open the cover
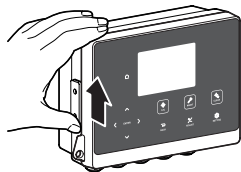
Slide up the lock lever.
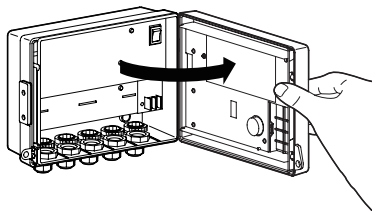
Pull the cover to open.

To close the cover
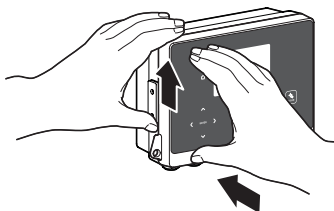
Slide up the lock lever while holding the cover, and close the cover tightly without a gap.
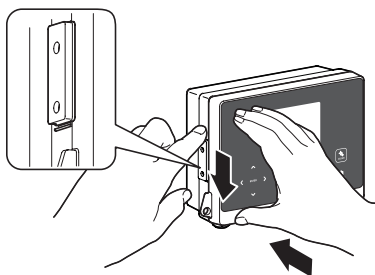
Push and hold the cover, and make sure to slide down the lock lever to the indicated line.

Caution	After closing the cover, make sure that the cover is fixed by the lock lever and that it cannot be opened. If the cover is opened, sufficient protection may not be provided.

Operation button

No.	Name	Description of Functions
(1)	HOME	The indication returns from menu to measurement value display.
Selection button		
(2)	UP/DOWN/ LEFT/RIGHT	• UP/DOWN: Used to select an item in the setting menu. Or, used to increase/decrease a value of the selected digit in the numerical input. • LEFT/RIGHT: Used to switch between pages or select an item in the setting menu. Or, used to select a digit in the numerical input. In addition, pressing both left and right simultaneously while entering a value resets the value to the default value.
(3)	ENTER	Used to determine the selected item in the setting menu. Or, used to determine the entered value in the numerical input.
(4)	BACK	Used to cancel an item in the setting. Or, used to return to the previous display if no item is being selected.
Function button		
(5)	CAL	Used to calibrate the sensor ("6 Calibration" P.60).
(6)	MAINT	Used to retain a measurement value "measurement value hold" or to configure the hold timer setting ("8 Maintenance Setting" P.66).
(7)	CLEAN	Used to perform cleaning of the sensor or setting of cleaning time ("9 Cleaning" P.73).
(8)	SETTING	Used to perform settings such as input/output and date/time ("5 Setting Menu" P.20).
(9)	ADJUST	Used to correct a measurement value ("7 Adjustment" P.63).

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Display

The display shows information of SC-U1 and installed sensors.
If more than one sensor is installed, the display is divided to display a respective measurement value in each pane.

(1) Status bar
(2) Sensor channel number
(3) Main display
(4) 2nd display
(5) 3rd display
(6) Sensor status
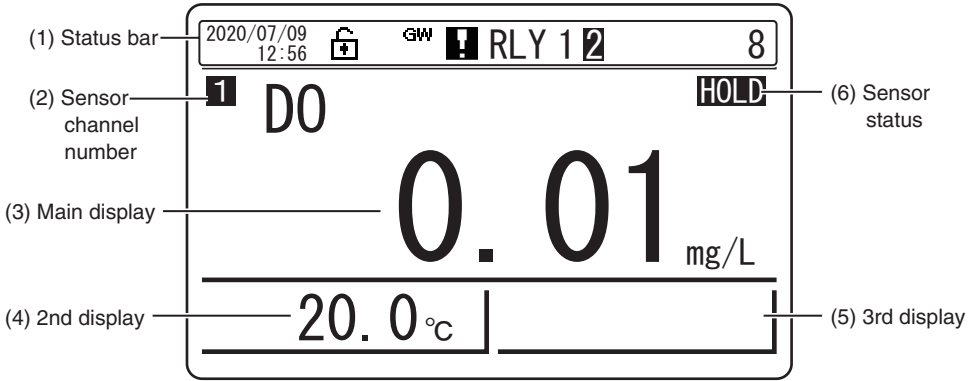
No.	Name	Description of Functions
(1)	Status bar	Shows the SC-U1 status ("Status bar details" P.15).
(2)	Sensor channel number	Shows the channel number of the sensor of the measurement value.
(3)	Main display	Measurement values are displayed.
(4)	2nd display	Which measurement is assigned to the 1st, 2nd or 3rd display can be optionally set ("Display Item" P.22).
(5)	3rd display	Nothing is displayed if the display item is set to OFF.
(6)	Sensor status	Shows the status of the sensor.

◆ Indication when more than one sensor is installed

Individual measurement value is displayed for each sensor installed.

Main display
2nd display
3rd display
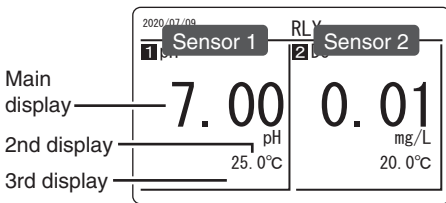
2 sensors installed
(Dual indication)

Main display
2nd display
3rd display
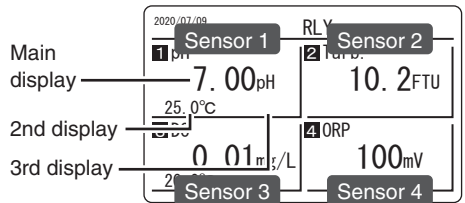
3 to 4 sensors installed
(Quad indication)

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◆ Status bar details

(1) Date/time
(2) Button lock status
(3) Connection status
(4) Information status
(5) Relay output status

No.	Name	Description of Functions
(1)	Date/time	Shows the current date and time when the gateway is connected.
(2)	Button lock status	Shows the passcode lock status of the operation buttons ("Passcode lock" P.52). • Function OFF: The icon is hidden • Unlocked: 🔓 • Locked: 🔒
(3)	Connection status	Shows a device being installed. • **GW**: Gateway
(4)	Information status	Shows presence of information requiring an attention such as an error.
(5)	Relay output status	Shows the relay status with relay output number. • Number being indicated (1): The relay is enabled • Number being indicated (1): The relay is outputting • No number being indicated: The relay is off

3 **Operations on first boot/starting a task**

Startup flow

◆ On first boot

1 **Refer to the "Universal Transmitter SC-U1 Installation Manual" to install the unit and perform wiring.**

2 **Make sure that wiring has been properly done and turn on the power switch.**

Caution	Make sure there is no yellow cushioning material left at the top and bottom and remove it if any. Otherwise the degree of protection may be compromised.

Power switch

ON
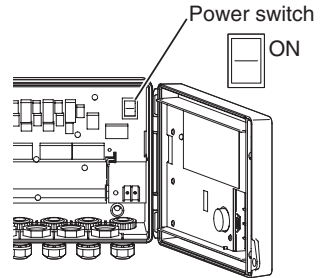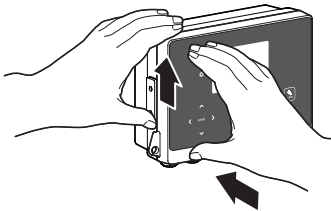
3 **Close the cover.**

Push up the lock lever while holding the cover, and close the cover tightly without a gap.
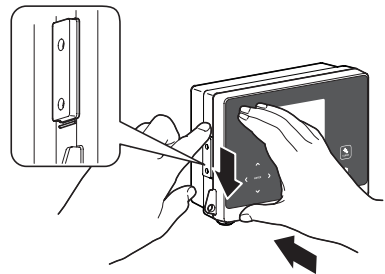
Push and hold the cover, and make sure to pull down the lock lever to the indicated line.

4 **After "WATER it" is displayed, the measurement value display is displayed.**

WATER **it**

SC–U1 (E)   Ver. 100

2020/07/09
12:56   RLY

1 DO

0. 01 mg/L

20. 0 °c
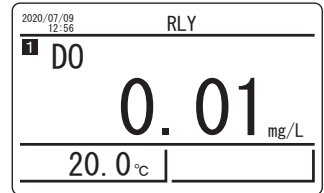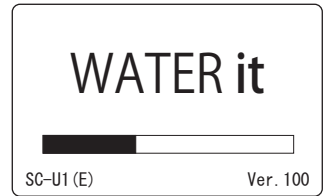
5 **Secure the cover by attaching the supplied cover fixing screw to the hole in the cover as needed.**
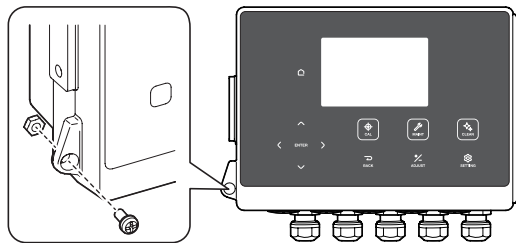
◆ Unlock passcode

If passcode lock is set, normal button operations are disabled after a certain period of no operation ("Passcode lock" P.52).
The factory default setting is OFF for passcode lock.
Pressing any button under the locked status shows the passcode input display.

```
┌─────────────────────────────┐
│       Passcode Lock         │
│                             │
│          Passcode           │
│                             │
│          █ _ _ _            │
│                             │
└─────────────────────────────┘
```
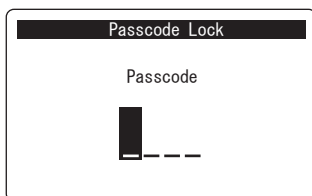
To unlock, use the following steps and enter the passcode.

Caution	If you forgot the passcode, refer to "When in trouble" P.84, "Passcode lock cannot be unlocked".

1 Select a digit by 〈 〉 and value by ∧ ∨, and type in the 4-digit passcode.

If there is no operation on the passcode input display for one minute, the display returns to the measurement value display.

```
┌─────────────────────────────┐
│       Passcode Lock         │
│                             │
│          Passcode           │
│                             │
│          █ _ _ _            │
│                             │
└─────────────────────────────┘
```
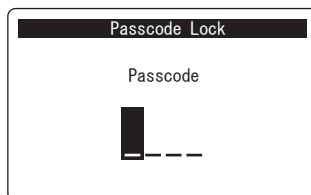
2 Press ENTER .

If entered correctly, the lock is unlocked and button operations are enabled.

```
┌─────────────────────────────┐
│ 2020/07/09  🔒      RLY      │
│  12:56                      │
│ ▌ DO                        │
│        0. 01  mg/L          │
│   20. 0 ℃                   │
└─────────────────────────────┘
```
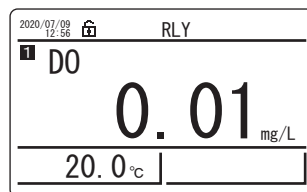
4 Available Operations for SC-U1

 SETTING **Setting**	**Sensor Setting** Configure the sensor information and settings.	
	Reference: "5.1 Sensor Setting"	P.20
	GW setting Configure the basic settings of the gateway (optional) and the items you want to output to the gateway.	
	Reference: "5.2 GW (Gateway) Setting"	P.26
	4-20 mA Setting Set the measurement items and output range that you want to output from the 4-20 mA output.	
	Reference: "5.3 4-20 mA Setting"	P.30
	Relay Setting Set the measurement items to be output from the relay output, and set active level, on delay, and off delay.	
	Reference: "5.4 Relay Setting"	P.38
	Main Unit Setting Configure the main unit's date and time (display type) settings, passcode lock settings, and contrast adjustment.	
	Reference: "5.5 Main Unit Settings"	P.50
 CAL **Calibration**	Use distilled water or ion exchanged water to adjust the sensor measurement value to the reference value (zero). In addition, adjust the sensor measurement value to the reference value using the standard solution. Reference: "6 Calibration"	P.60
 ADJUST **Adjustment**	The measurement values can be adjusted and displayed according to usage. In addition, when the ambient environment (salinity and altitude) affects the measurement value of the sensor, the information can be input and the measurement value can be adjusted and displayed according to the ambient environment. Reference: "7 Adjustment"	P.63
 MAINT **Maintenance**	The measurement value can be held to the previous value for maintenance or cleaning. Also, relay output related to sensor maintenance can be set.	
	Reference: "8 Maintenance Setting"	P.66
 CLEAN **Cleaning**	If the sensor is equipped with a cleaning device, or if the external cleaning device is connected to the relay output, the operating timer of the cleaning device can be set for automatic cleaning. The cleaning device can also be operated manually.	
	Reference: "9 Cleaning"	P.73

If there is no operation on a display such as menu for three minutes, the display returns to the measurement value display. However, it does not return to the measurement value display even if no operation is performed while the function of each operation is being executed.

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5 Setting Menu

5.1 Sensor Setting ⟨Sensor⟩

Sensor setting

Configure the sensor information and settings.

Caution Pressing 🔧 automatically retains the measurement value.

1 **Press 🔧.**

The setting menu is displayed.

2 **Select [Sensor Setting] using**
  ∧ ∨, and press ENTER.

The sensor selection display is displayed.

```
              Setting

          Setting Menu
Sensor Setting
GW Setting
4-20mA Setting
Relay Setting
Main Unit Setting
```

3 **Select a sensor to set using ∧ ∨,**
  and press ENTER.

```
            Sensor Setting

          Sensor Select
1  pH         SE-pH-D
2  Turb.      TC-3000-D
3  DO         DOS-20
4
```

Measurement Sensor
item   model
Sensor channel

The sensor setting menu is displayed.

```
            Sensor Setting
1  DO          DOS-20

Display Item
Response Time        10 sec.
```

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Item	Description	Refer to
Display Item	Set the measurement items to be displayed in the main, the second, and the third display fields ("Display" P.14). Main display ———— 0.01 mg/L 2020/07/09 12:56 RLY DO 2nd display ———— 20.0 ℃ ———— 3rd display Available display items depend on a sensor.	P.22
Response Time	Set the signal output response time to calculate the moving average and the measurement value.	P.25
Cal. Mode	Set the calibration mode.	Sensor's instruction manual
Cal. Standard	Set the standard to be applied to the calibration.	
Cal. Solution 1	Set the first standard solution. Items are displayed based on the calibration standard.	
Cal. Solution 2	Set the second standard solution. Items are displayed based on the calibration standard.	

◆ Display Item

The measurement items can be set to display in the main, second, and third display fields ("Display" P.14).
Available display items differ for a sensor. Refer to each sensor's instruction manual.

Caution	When the display item is changed, the values set on "Send channel setting" P.28, "4-20 mA setting (4-20 mA output item setting)" P.32, and "Relay setting" P.40 for which the display items have been set turn OFF. The values of "Offset Adjustment", "Span Adjustment", and "2-Point Adjustment" described in "7 Adjustment" P.63 returns to the factory default values. Set again if necessary.

1 **On the sensor selection display, select a sensor to set using** ∧ ∨ **, and press** ENTER **.**

The sensor setting menu is displayed.

```
        Sensor Setting

        Sensor Select
   1  DO          DOS-20
   2
   3
   4
```

Measurement item   Sensor model
Sensor channel
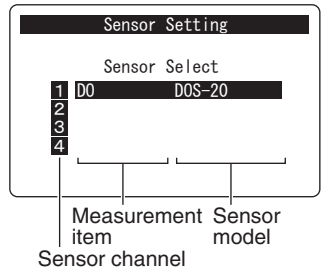
2 **Select [Display Item] using** ∧ ∨ **, and press** ENTER **.**

Current display item setting is displayed.

```
        Sensor Setting
   1  DO          DOS-20

   Display Item
   Response Time       10 sec.
```
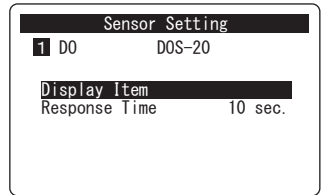
3 **Select [Main Dis.] using** ∧ ∨ **, and press** ENTER **.**

Available setting items for the main display are displayed.

```
        Sensor Setting
   1  DO          DOS-20
           Display Item
   Main Dis.          DO
   2nd Dis.           Temp.
   3rd Dis.           OFF
```

Current setting item
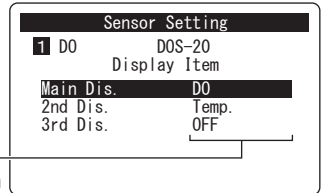
The main display item is displayed largest when displaying measurement value.

```
2020/07/09        RLY
12:56
 1  DO


      0. 01 mg/L
    20. 0 ℃
```

Main display

4 **Select an item to display as the main display using ∧ ∨, and press ENTER.**

The display returns to the display item selection display.

```
          Sensor Setting
 1 DO          DOS-20
          Main Display Item
 DO                mg/L
 %Sat.             % sat
 O-Press.          kPa
```
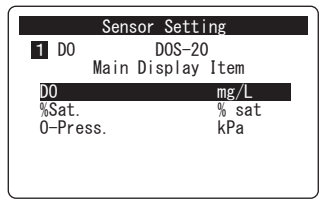
5 **Select [2nd Dis.] using ∧ ∨, and press ENTER.**

Available setting items for the 2nd display are displayed.

```
          Sensor Setting
 1 DO          DOS-20
          Display Item
 Main Dis.         DO
 2nd Dis.          Temp.
 3rd Dis.          OFF
```
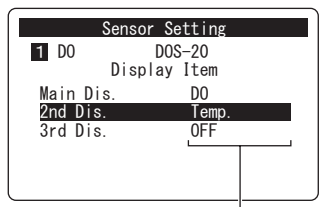
Current setting item

The 2nd display item is displayed on the lower left of the main display item.

```
 2020/07/09            RLY
   12:56
 1 DO
        0. 01 mg/L
        20. 0 ℃
```
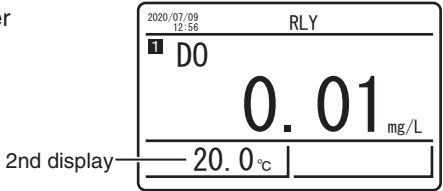
2nd display

6 **Select an item to display as the 2nd display using ∧ ∨, and press ENTER.**

If [OFF] is selected, nothing is displayed.
The display returns to the display item selection display.

```
          Sensor Setting
 1 DO          DOS-20
          Second Display Item
 OFF
 Temp.             ℃
```

23

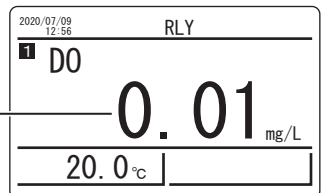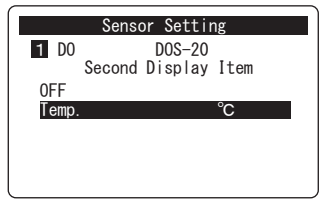**7** **Select [3rd Dis.] using** ∧ ∨ **,**
and press ENTER**.**

Available setting items for the 3rd display are
displayed.

```
            Sensor Setting
 1  DO          DOS-20
            Display Item
 Main Dis.        DO
 2nd Dis.         Temp.
 3rd Dis.         OFF
```
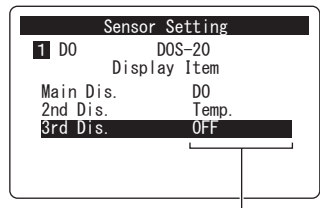
Current setting item

The 3rd display item is displayed on the lower
right of the main display item.

```
2020/07/09          RLY
  12:56
 1  DO

              0. 01 mg/L
     20. 0 ℃
```
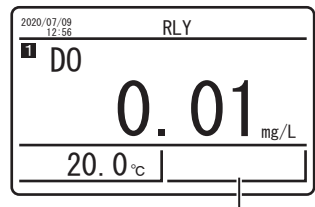
3rd display

8 **Select an item to display as the 3rd display**
using ∧ ∨ **, and press** ENTER**.**

If [OFF] is selected, nothing is displayed.
The display returns to the display item selection display.

```
            Sensor Setting
 1  DO          DOS-20
         Third Display Item
 OFF
 DO               mg/L
 %Sat.            % sat
 0-Press.         kPa
```

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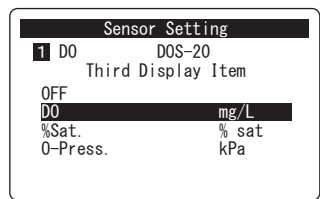
◆ **Response Time**

Set a signal output response time.

A measurement value is calculated using moving average of the time period configured by the signal output response time. For example, if the sensor measures values every 5 seconds and the signal output response time is set to 50 seconds, which is 5 seconds × 10 times, the moving average of 10 times measurement is calculated and used as the measurement value. The setting range is shown below.

	Setting range	**Factory default setting**
Response Time	5 to 600 seconds (by 5 seconds)	5 seconds

Shown below is an example of configuring 10 seconds as the signal response time.

1 **On the sensor selection display, select a sensor to set using $\wedge$ $\vee$, and press ENTER.**

The sensor setting menu is displayed.

```
         Sensor Setting

         Sensor Select
 1 pH          SE-pH-D
 2 Turb.       TC-3000-D
 3 DO          DOS-20
 4
```

Measurement item   Sensor model
Sensor channel
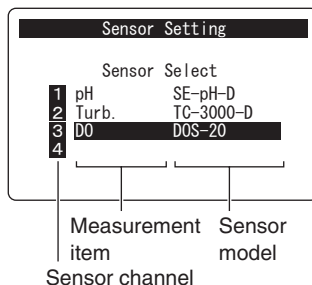
2 **Select [Response Time] using $\wedge$ $\vee$, and press ENTER.**

The current setting value is displayed.

```
         Sensor Setting
 3 DO          DOS-20

 Display Item
 Response Time        5 sec.
```
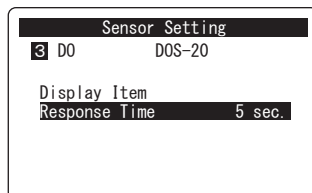
3 **Select a digit by $\langle$ $\rangle$ and value by $\wedge$ $\vee$, and type in a value.**

In this example, "10" is typed in to set as 10 seconds.
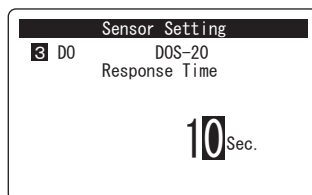
```
         Sensor Setting
 3 DO          DOS-20
         Response Time

              10 Sec.
```

When a value outside the set range is entered, a short beep sounds.

Press $\langle$ $\rangle$ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or BACK, the value returns to the one before changing it.

4 **Press ENTER.**

The setting is complete and the display returns to the sensor setting menu.

5.2 GW (Gateway) Setting

When an optional gateway is connected, the basic gateway settings and send channel settings can be made from SC-U1.
For detailed gateway settings, refer to gateway's instruction manual.

> Caution Pressing 🔧 automatically retains the measurement value.

GW Setting

1 **Press** 🔧 **.**

The setting menu is displayed.

2 **Select [GW Setting] using** ∧ ∨ **,
and press ENTER .**

```
              Setting

          Setting Menu
     Sensor Setting
     GW Setting
     4-20mA Setting
     Relay Setting
     Main Unit Setting
```

The GW setting menu is displayed.

```
              GW Setting


     Basic Setting
     Send Channel Setting
```
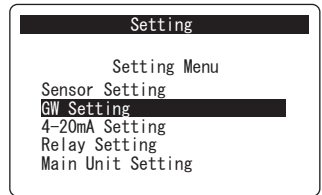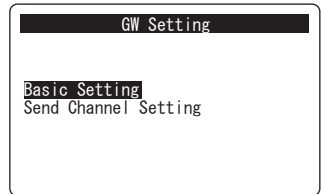
Item	Description	Refer to
Basic Setting	Configure the basic gateway settings. The following settings are available.	
	Time zone: Set the time zone. Select a value for the difference from UTC (Universal Time Coordinated).	P.27
Send Channel Setting	Set the Send Item and Send Interval to the Send Channel. Up to 12 channels can be set. The measurement item set on "Display Item" P.22 can be selected as the Send Item.	P.28

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Basic setting

◆ Time Zone

Set the time zone of the gateway. Select a time difference from UTC (Universal Time Coordinated).

1 **In the GW setting menu, select [Basic Setting] using ∧ ∨, and press ENTER.**

The basic GW setting menu is displayed.

```
        GW Setting

Basic Setting
Send Channel Setting
```
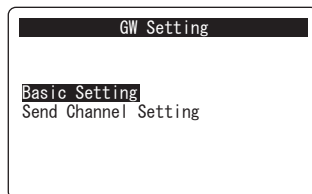
2 **Select [Time Zone] using ∧ ∨, and press ENTER.**

The current setting value is displayed.

```
        GW Setting

      Basic Setting
Time Zone        UTC+09:00
```
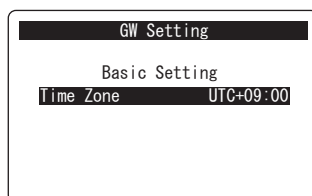
3 **Select a time difference from UTC using ∧ ∨, and press ENTER.**

In case of Japan, it is "UTC+09:00" (factory default setting).
The setting is complete and the display returns to the basic GW setting menu.
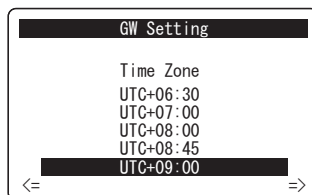
```
        GW Setting

      Time Zone
      UTC+06:30
      UTC+07:00
      UTC+08:00
      UTC+08:45
      UTC+09:00
<=                         =>
```

Send channel setting

Set the Send Item and Send Interval to the Send Channel.
Up to 12 channels can be configured.
The Send Item is OFF at the factory default setting.

<table>
<tr><td>Caution</td><td>When the item on "Display Item" P.22 is changed, the value of the send channel setting for which the display item has been set turns OFF.
Set again if necessary.
The maximum number of channels that can be sent depends on the gateway.</td></tr>
</table>

1 **In the GW setting menu, select**
[Send Channel Setting] using ∧ ∨ ,
and press ENTER.

The send channel setting display is displayed.
Up to 12 channels are available for transmission
to the gateway.

```
            GW Setting


Basic Setting
Send Channel Setting
```
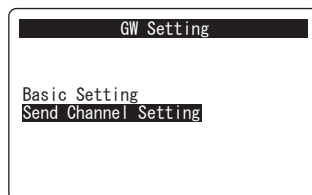
2 **Select a channel using ∧ ∨ , and**
press ENTER.

In the selected channel, the set Send Item and
Send Interval are displayed.

```
            GW Setting

       Send Channel Setting
      Send Item      Send Interval
CH1: 1 pH                  15 min.
CH2:   OFF
CH3: 3 Temp.             1440 min.
CH4: 2 Turb.               60 min.
                              =>
```
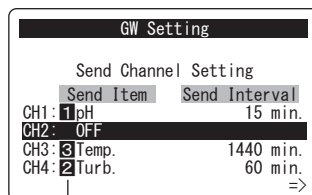
Sensor channel

3 **Select [Send Item Select] using ∧ ∨ ,**
and press ENTER.

```
            GW Setting
CH1

Send Item Select
    OFF
```
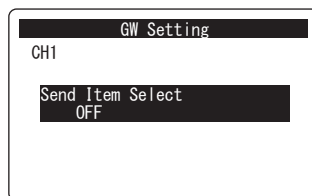
4 **Select a send item to the channel using**
∧ ∨ , and press ENTER.

The measurement item set on "Display Item"
P.22 can be selected as the send item.

```
            GW Setting
CH1
        Send Item Select
     OFF
  1  pH          SE-pH-D
  1  Temp.       SE-pH-D
  2  Turb.       TC-3000-D
  3  DO          DOS-20
                         =>
```
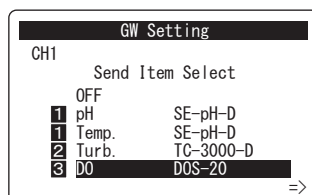
5 Use ∧ ∨ to select [Send Interval Setting] and press ENTER.

```
          GW Setting
CH1

Send Item Select
 3 DO           DOS-20
Send Interval Setting
   15 min.
```
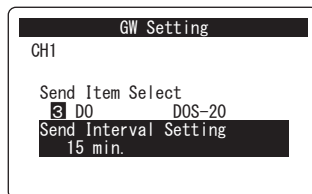
6 Enter the send interval.

Select a digit by ⟨ ⟩ and value by ∧ ∨, and press ENTER.

```
          GW Setting
CH1  3 DO       DOS-20
     Send Interval Setting


            15 min.
```
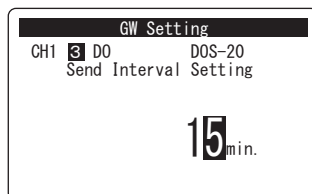
The configured send item and interval for the channel are updated.

Pressing ⟲BACK returns to the send channel setting display.

	Setting range	Factory default setting
Send interval	1 to 1440 minutes	15 minutes

When a value outside the set range is entered, a short beep sounds.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⟲BACK, the value returns to the one before changing it.

5.3 4-20 mA Setting

Set the 4-20 mA signal output settings.
The factory default setting is OFF for 4-20 mA signal output.

Caution	Pressing ⚙ automatically retains the measurement value.

1 **Press ⚙.**

The setting menu is displayed.

2 **Select [4-20 mA Setting] using ∧ ∨,**
and press ENTER.

```
              Setting

         Setting Menu
    Sensor Setting
    GW Setting
    4-20mA Setting
    Relay Setting
    Main Unit Setting
```
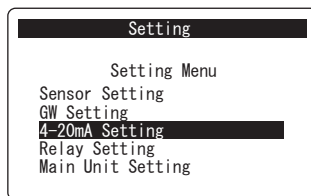
The channel selection display is displayed.
For each channel of 4-20 mA output, the current
sensor channel, output item, and signal output
range are displayed.

To switch between pages, press < >.
On the last page, 4-20 mA test mode can be

selected.

```
            4-20mA Setting

         Channel Select
       Output Item   4mA    20mA
  CH1: 1pH          0.00   14.00pH
  CH2:  OFF
  CH3: 3Temp.        0.0    50.0℃
  CH4: 2Turb.        0.0   100.0FTU
                                  =>
```

Output item

Sensor channel

3 **Select a channel to set using ∧ ∨, and press ENTER.**

The setting item selection menu is displayed.

```
            4-20mA Setting
  CH2

  Output Item Select
     OFF
```

Item		Description	Refer to
4-20 mA Setting	4-20 mA output item setting	The following settings are available.	
		Output item selection: Select an item to output by 4-20 mA signal. The measurement item set on "Display Item" P.22 can be selected as the output item.	P.32
		Signal output range lower limit/signal output range upper limit: For the item selected in the "Output Item Select", specify measurement value to output at lower limit (Lo, 4 mA) and upper limit (Hi, 20 mA). 20 mA ┄┄┄┄┄┄┄┄┄┄┄● Signal output 4 mA ┄┄┄● Measurement value at 4 mA Measurement value at 20 mA	P.33, P.34
	Fine adjustment for 4-20 mA output	4 mA Fine adjustment: The lower limit of signal output, 4 mA, can be fine-tuned when there is a discrepancy between the output value of the product and the displayed value of a connected device such as a recorder (data logger).	P.35
		20 mA Fine adjustment: The upper limit of signal output, 20 mA, can be fine-tuned when there is a discrepancy between the output value of the product and the displayed value of a connected device such as a recorder (data logger).	P.36
4-20 mA Test mode		A test output of 4, 12, and 20 mA can be performed to check the signal output status to a device such as a recorder (data logger).	P.37

4-20 mA setting (4-20 mA output item setting)

◆ Output Item Select

Select an item to output by 4-20 mA signal.

Caution	When the item on "Display Item" P.22 is changed, the output item of the 4-20 mA setting channel for which the display item has been set turns OFF. Set again if necessary.

1 **On the channel selection display, switch between pages using ☐ ☐ , select a channel to set using ☐ ☐ , and press ENTER.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
        4-20mA Setting

      Channel Select
      Output Item    4mA    20mA
CH1 : 1 pH          0.00   14.00pH
CH2 :  OFF
CH3 : 3 Temp.       0.0    50.0℃
CH4 : 2 Turb.       0.0   100.0FTU
                               =>
```
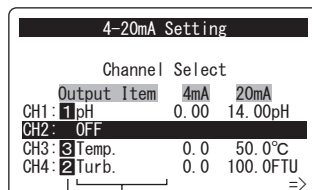
Output item
Sensor channel

2 **Select [Output Item Select] using ☐ ☐ , and press ENTER.**

A list of output items is displayed.
The measurement item set on "Display Item" P.22 can be selected as the output item.
Available display items depend on an installed sensor.

```
        4-20mA Setting
CH2

Output Item Select
   OFF
```

3 **Switch between pages using ☐ ☐ , select an item to output using ☐ ☐ , and press ENTER.**

If output is unnecessary, select [OFF] and press ENTER.

The indication returns to the setting item selection menu.
To proceed, go to step 2 of "Signal output range lower limit" P.33.

```
        4-20mA Setting
CH2
      Output Item Select
      OFF
   1  pH          SE-pH-D
   1  Temp.       SE-pH-D
   2  Turb.       TC-3000-D
   3  DO          DOS-20
                            =>
```
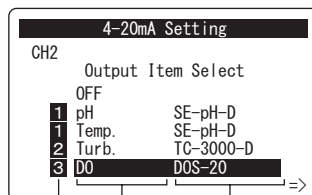
Output   Sensor
item   model
Sensor channel

◆Signal output range lower limit

For the item selected in the "Output Item Select", set measurement value to output at lower limit (Lo, 4 mA).

1 **On the channel selection display, switch between pages using ⟨ ⟩, select a channel to set using ∧ ∨, and press ENTER.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
           4-20mA Setting

           Channel Select
         Output Item    4mA    20mA
CH1: 1 pH             0.00   14.00pH
CH2: 3 DO              0.0   50.00mg/L
CH3: 3 Temp.          0.0   50.0℃
CH4: 2 Turb.          0.0  100.0FTU
                                  =>
```

Output item
Sensor channel

2 **Select [Low Limit Setting] using ∧ ∨, and press ENTER.**

The current setting value is displayed.

```
           4-20mA Setting
CH2

    Output Item Select
     3 DO            DOS-20
    Low Limit Setting
     4mA =   0.00mg/L
    High Limit Setting
     20mA =  50.00mg/L         =>
```

3 **Select a digit by ⟨ ⟩ and value by ∧ ∨, and press ENTER.**

When a value outside the set range is entered, a short beep sounds. The setting range varies depending on the measurement item. Refer to the instruction manual of each sensor.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⤺BACK, the value returns to the one before changing it.

The display returns to the setting item selection menu.
To proceed, go to step 2 of "Signal output range upper limit" P.34.

```
           4-20mA Setting
CH2 3 DO            DOS-20
      Low Limit Setting
 4mA

         0.00 mg/L
```

4-20 mA Setting

33

◆ Signal output range upper limit

For the item selected in the "Output Item Select", set the measurement value to output at upper limit (Hi, 20 mA).

1 On the channel selection display, switch between pages using ◁ ▷ , select a channel to set using ∧ ∨ , and press ENTER.
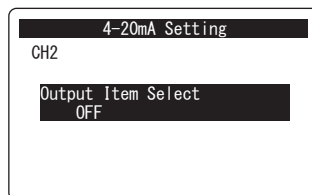
The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
         4-20mA Setting

        Channel Select
     Output Item   4mA    20mA
CH1: 1 pH        0.00   14.00pH
CH2: 3 DO         0.0   50.00mg/L
CH3: 3 Temp.      0.0    50.0℃
CH4: 2 Turb.      0.0   100.0FTU
                               =>
```
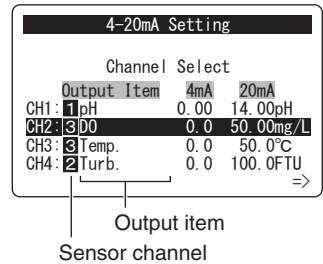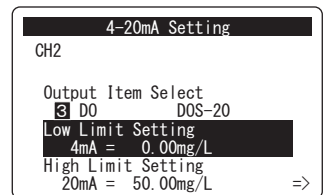
Output item

Sensor channel
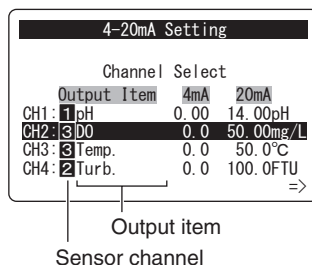
2 Select [High Limit Setting] using ∧ ∨ , and press ENTER.
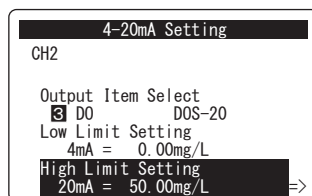
The current setting value is displayed.

```
         4-20mA Setting
CH2

Output Item Select
 3 DO             DOS-20
Low Limit Setting
   4mA =   0.00mg/L
High Limit Setting
  20mA =  50.00mg/L          =>
```

3 Select a digit by ◁ ▷ and value by ∧ ∨ , and press ENTER.
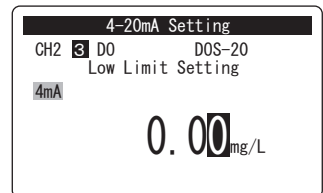
When a value outside the set range is entered, a short beep sounds. The setting range varies depending on the measurement item. Refer to the instruction manual of each sensor.

Press ◁ ▷ simultaneously while entering a value to reset to the factory default setting.

By pressing 🏠 or ⮌BACK, the value returns to the one before changing it.

The display returns to the setting item selection menu.

```
         4-20mA Setting
CH2 3 DO          DOS-20
     High Limit Setting
20mA

        50.00 mg/L
```
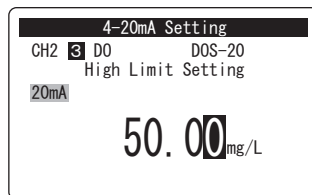
4-20 mA Setting

4-20 mA output setting (fine adjustment for 4-20 mA output)

Although this product is delivered after strict in-house inspection, the output value of this product may differ from the displayed value of the connected devices such as a recorder (data logger).
In such a case, you can fine-adjust the lower limit 4 mA and upper limit 20 mA for the signal output (4-20 mA).

◆ 4 mA Fine adjustment

The lower limit of signal output, 4 mA, can be fine-tuned when there is a discrepancy between the output value of the product and the displayed value of a connected device such as a recorder (data logger).

1 **On the channel selection display, switch between pages using** ◁ ▷ **, select a channel to set using** ∧ ∨ **, and press** ENTER **.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
          4-20mA Setting

        Channel Select
     Output Item    4mA    20mA
CH1: 1 pH          0.00   14.00pH
CH2: 3 DO          0.0    50.00mg/L
CH3: 3 Temp.       0.0    50.0℃
CH4: 2 Turb.       0.0    100.0FTU
                              =>
```

Output item
Sensor channel
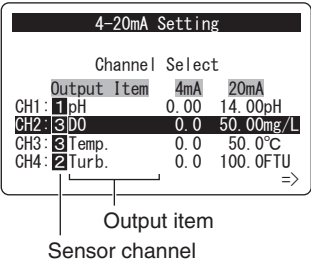
2 **Switch between pages using** ◁ ▷ **, select [4 mA Fine adjustment] using** ∧ ∨ **, and press** ENTER **.**
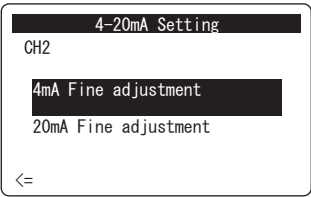
```
          4-20mA Setting
CH2

 4mA Fine adjustment

 20mA Fine adjustment

<=
```

3 **While checking indicated value of the connected device such as a recorder, adjust the signal output using** ∧ ∨ **, and press** ENTER **.**

The display returns to the setting item selection menu.
To proceed, go to step 2 of "20 mA Fine adjustment" P.36.
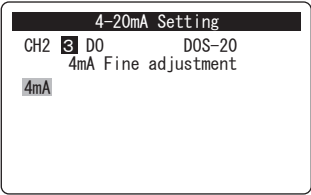
```
          4-20mA Setting
CH2  3 DO          DOS-20
      4mA Fine adjustment
  4mA
```

35

◆ 20 mA Fine adjustment

The upper limit of signal output, 20 mA, can be fine-tuned when there is a discrepancy between the output value of the product and the displayed value of a connected device such as a recorder (data logger).

1 **On the channel selection display, switch between pages using** `<` `>` **, select a channel to set using** `∧` `∨` **, and press** ENTER **.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
        4-20mA Setting

         Channel Select
    Output Item   4mA    20mA
CH1: 1 pH        0.00   14.00pH
CH2: 3 DO         0.0   50.00mg/L
CH3: 3 Temp.      0.0    50.0℃
CH4: 2 Turb.      0.0   100.0FTU
                              =>
```

Output item
Sensor channel
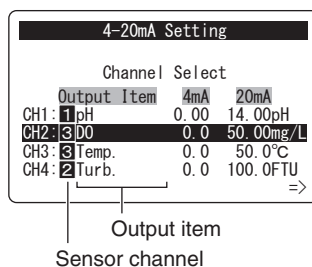
2 **Switch between pages using** `<` `>` **, select [20 mA Fine adjustment] using** `∧` `∨` **, and press** ENTER **.**
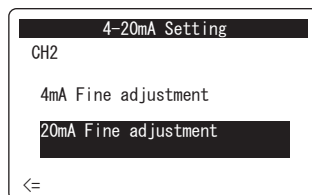
```
        4-20mA Setting
CH2

  4mA Fine adjustment

  20mA Fine adjustment

<=
```

3 **While checking indicated value of the connected device such as a recorder, adjust the signal output using** `∧` `∨` **, and press** ENTER **.**

```
        4-20mA Setting
CH2  3 DO          DOS-20
      20mA Fine adjustment
  20mA
```

The display returns to the setting item selection menu.

4-20 mA Setting
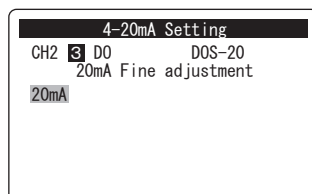
4-20 mA test mode

A test output of 4, 12, and 20 mA can be performed to check the signal output status to a recorder (data logger).

1 **On the channel selection display,**

press $>$ **to switch between pages.**

```
            4-20mA Setting

        Channel Select
    Output Item    4mA     20mA
CH1: 1 pH         0.00    14.00pH
CH2: 3 DO          0.0    50.00mg/L
CH3: 3 Temp.       0.0    50.0℃
CH4: 2 Turb.       0.0    100.0FTU
                              =>
```

Output item

Sensor channel

4-20 mA Setting
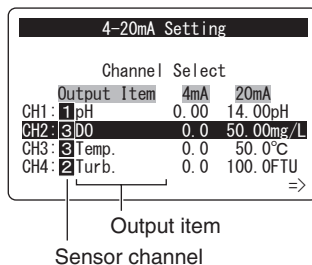
2 **Use $\wedge$ $\vee$ to select [4-20 mA Test mode]**

and press ENTER.

The 4-20 mA test mode menu is displayed.

```
            4-20mA Setting


        4-20mA Test mode



<=
```
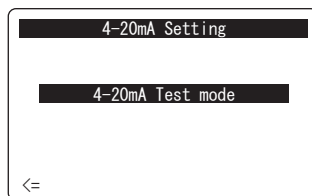
3 **Select a channel to set using $<$ $>$ and**
electrical current value to output using

$\wedge$ $\vee$ **.**

The selected current value is continuously output
from the selected channel.
In the initial status, ALL (all channels) and OFF (no
output) are selected.

When selected as shown to the right, 12 mA is
output from channel 2.

```
            4-20mA Setting

        4-20mA Test mode
  ALL  CH1   CH2   CH3   CH4

            OFF
            4mA
            12mA
            20mA
```

```
            4-20mA Setting

        4-20mA Test mode
   ALL  CH1   CH2   CH3   CH4

            OFF
            4mA
            12mA
            20mA
```

4 **To end the test, press $\overset{\supset}{\text{BACK}}$.**

37
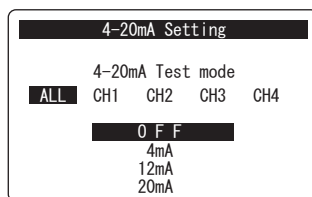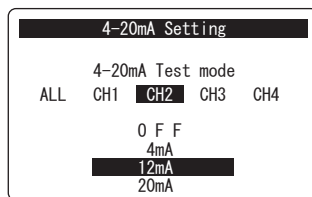
5.4   Relay Setting

Configure the relay output settings.
The factory default setting is OFF for relay output.

Caution   Pressing ⚙️ automatically retains the measurement value.

1   Press ⚙️.

The setting menu is displayed.

**2   Select [Relay Setting] using ∧ ∨,
and press ENTER.**

```
                    Setting

              Setting Menu
      Sensor Setting
      GW Setting
      4-20mA Setting
      Relay Setting
      Main Unit Setting
```
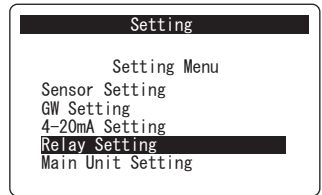
The channel selection display is displayed.
For each relay output channel, the current sensor
channel, output item, trigger setting, and active level
are displayed.

To switch between pages, press ‹ › .

On the last page, relay test mode can be selected.

```
                 Relay Setting

              Channel Select
           Output Item  Trig.   Level
      CH1:  OFF
      CH2: 3 DO         High   8.00mg/L
      CH3: 3 DO         Low    5.00mg/L
      CH4: 3 Sens. Cap
                                      =>
```

Output item
Sensor channel
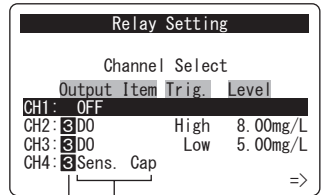
**3   Select a channel to set using ∧ ∨,
and press ENTER.**

The relay setting menu is displayed.

```
      Relay Setting
  CH1

  Output Item
      OFF
```

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Item	Description	Refer to
Relay Setting	The following settings are available.	
	Alarm output setting: Configure various settings to output an alarm when the measurement value exceeds a fixed value. The measurement item set on "Display Item" P.22 can be selected as the output item of alarm output.	P.40
	Maintenance output setting: Configure the settings to notify the user when maintenance will be performed. <Setup Workflow> 1. Configure the setting of "Maintenance Timer" P.70. 2. Configure the setting of "Maintenance output setting" P.46.	P.46, P.70
	Sensor cap output setting: Set to notify the replacement time of the sensor cap. <Setup Workflow> Refer to the sensor's instruction manual to configure the setting in the following order. 1. Configure the setting of "Sensor Cap Replacement Timer". 2. Configure the setting of "Sensor Cap Output Setting".	Sensor's instruction manual
	Cleaning output setting: The operation of the cleaning device can be set using relay output. <Setup Workflow> 1. Configure the setting of "Cleaning Interval (Relay)" P.76. 2. Configure the setting of "Cleaning Activation" P.77 as needed. 3. Configure the setting of "Post-cleaning Standby" P.78 as needed. 4. Configure the setting of "Cleaning output setting" P.47.	P.47, P.76, P.77, P.78
	Self Checking output setting: Set to notify malfunctions such as sensor failure and disconnection. When Self Checking output is selected, NO and NC are reversed.	P.48
Relay Test Mode	Switch the relay ON/OFF to check the output status to the control panel, etc.	P.49

Relay setting

◆ Alarm output setting

Set the alarm to be output when the measurement value exceeds a certain value.
The measurement item set on "Display Item" P.22 can be selected as the output item of alarm output.

> **Caution** When the item on "Display Item" P.22 is changed, the output item of the relay setting channel for which the display item has been set turns OFF.
> Set again if necessary.

1 **On the channel selection display, switch between pages using** ❮ ❯ **, select a channel to set using** ∧ ∨ **, and press** ENTER **.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
             Relay Setting

          Channel Select
        Output Item Trig.  Level
CH1:  OFF
CH2: 3DO           High   8.00mg/L
CH3: 3DO           Low    5.00mg/L
CH4: 3Sens Cap.                 =>
```

Output item

Sensor channel

2 **Select [Output Item] using** ∧ ∨ **, and press** ENTER **.**

A list of output items is displayed.
The measurement item set on "Display Item" P.22 can be selected as the output item.
Available display items depend on a connected sensor.

```
             Relay Setting
CH1


Output Item
    OFF

```
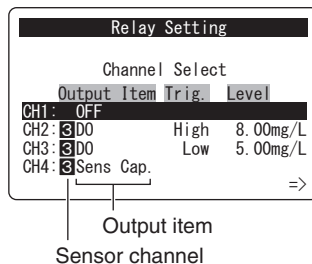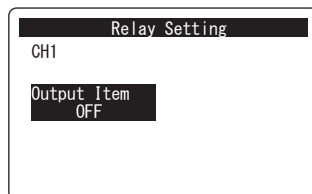
3 **Switch between pages using** ❮ ❯ **, select a channel and item of a sensor to set alarm output using** ∧ ∨ **, and press** ENTER **.**
If output is unnecessary, select [OFF] and press ENTER **.**

Available display items depend on a connected sensor.

The selected item is set as the alarm output target and displayed in [Output Item].

```
             Relay Setting
CH1
         Output Item Select
   2 Turb.      TC-3000-D
   2 Maint.     TC-3000-D
   2 Cleaning   TC-3000-D
   3 DO         DOS-20
   3 Temp.      DOS-20
<=         ⌐    ⌐       =>
```

Output   Sensor
item   model

Sensor channel

```
             Relay Setting
CH1

Output Item      Hysteresis
  3 DO              0.00mg/L
Trigger          On Delay
  High Alarm          OFF
Active Level     Off Delay
  50.00mg/L           OFF
```

Relay Setting
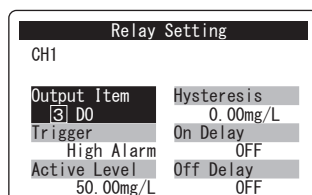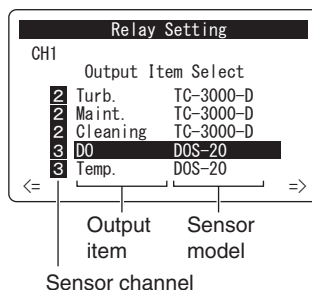
4 **If you selected an item for alarm output, set the following items additionally.**

Item	Description	Refer to
Trigger	For alarm output, set High Alarm (upper limit trigger) or Low Alarm (lower limit trigger). • High Alarm (upper limit trigger) Alarm condition is met when a measurement value exceeds the active level • Low Alarm (lower limit trigger) Alarm condition is met when a measurement value falls under the active level	P.42
Active Level	A measurement value can be set to activate On delay.	P.42
Hysteresis	The hysteresis can be set to cancel the alarm output.	P.43
On Delay	Specify a time period to output alarm after a measurement value exceeds the active level.	P.44
Off Delay	Specify a time period to cancel alarm output after a measurement value falls under (or exceeds) the alarm hysteresis.	P.45

Relay Setting

Example of operation when High Alarm (upper limit trigger) is set
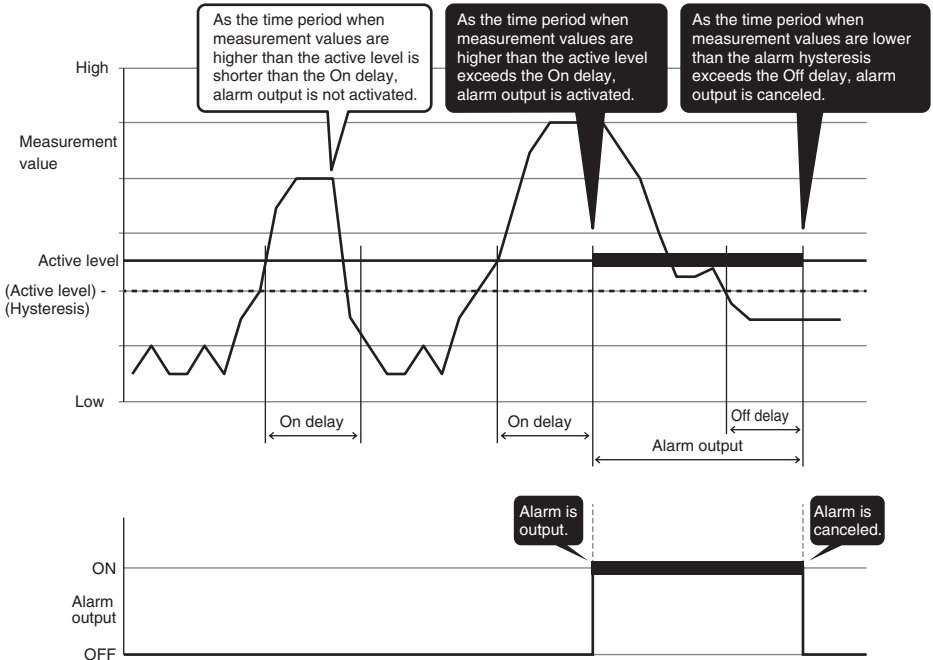
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● **Trigger**

For alarm output, set High Alarm (upper limit trigger) or Low Alarm (lower limit trigger).

1 **In the setting item selection menu, select [Trigger] using** ∧ ∨ **, and press** ENTER **.**

```
            Relay Setting
CH1

Output Item     Hysteresis
  3 DO            0.00mg/L
Trigger         On Delay
   High Alarm        OFF
Active Level    Off Delay
    50.00mg/L        OFF
```

2 **Select [High Alarm] or [Low Alarm] using** ∧ ∨ **, and press** ENTER **.**

- High Alarm (upper limit trigger)
  Alarm condition is met when a measurement value exceeds the active level
- Low Alarm (lower limit trigger)
  Alarm condition is met when a measurement value falls under the active level

The display returns to the setting item selection menu.

```
            Relay Setting
CH1  3 DO          DOS-20
       Trigger Setting

          High Alarm
          Low Alarm
```

● **Active Level**

Set a measurement value to activate the On delay.

1 **In the setting item selection menu, select [Active Level] using** ∧ ∨ **, and press** ENTER **.**

```
            Relay Setting
CH1

Output Item     Hysteresis
  3 DO            0.00mg/L
Trigger         On Delay
   High Alarm        OFF
Active Level    Off Delay
    50.00mg/L        OFF
```

2 **Select a digit by** ‹ › **and value by** ∧ ∨ **, and press** ENTER **.**

When a value outside the set range is entered, a short beep sounds. The setting range varies depending on the measurement item. Refer to each sensor's instruction manual.

Press ‹ › simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⇄BACK, the value returns to the one before changing it.

The display returns to the setting item selection menu.

```
            Relay Setting
CH1  3 DO          DOS-20
      Active Level Setting


         50.00mg/L
```

● **Hysteresis**

Set the hysteresis to cancel the alarm output.

1 **In the setting item selection menu, select [Hysteresis] using** $\wedge$ $\vee$ **, and press** ENTER **.**

```
          Relay Setting
CH1

Output Item    Hysteresis
  3 DO           0.00mg/L
Trigger        On Delay
   High Alarm        OFF
Active Level   Off Delay
    50.00mg/L        OFF
```

2 **Select a digit by** $<$ $>$ **and value by** $\wedge$ $\vee$ **, and press** ENTER **.**

- If the alarm trigger is set as High Alarm, set a value lower than the active level.
- If the alarm trigger is set as Low Alarm, set a value lower than the active level.

When a value outside the set range is entered, a short beep sounds. The setting range varies depending on the measurement item. Refer to each sensor's instruction manual.

Press $<$ $>$ simultaneously while entering a value to reset to the factory default setting.

By pressing $\bigcirc$ or $\underset{\text{BACK}}{\rightleftarrows}$, the value returns to the one before changing it.

The indication returns to the setting item selection menu.

```
          Relay Setting
CH1  3 DO        DOS-20
   Hysteresis Setting


         0.00 mg/L
```

Relay Setting
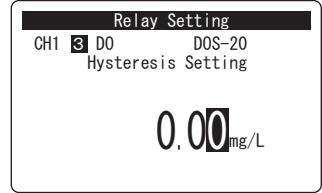
● On Delay (alarm timer)

Set a time period to output alarm after a measurement value exceeds the active level.

	Setting range	Factory default setting
On Delay	OFF 1 to 120 minutes	OFF

1 **In the setting item selection menu,**
select [On Delay] using ∧ ∨ **,**
and press ENTER **.**

```
          Relay Setting
CH1

Output Item      Hysteresis
  3 DO
Trigger          On Delay
    High Alarm         OFF
Active Level     Off Delay
      5.00mg/L          OFF
```

2 **Select a digit by** 〈 〉 **and value by**
∧ ∨ **, and press** ENTER **.**

• The initial setting is [OFF]. Pressing ∧ displays
the On delay input display.

```
          Relay Setting
CH1 3 DO          DOS-20
      On Delay Setting



          OFF
```

• When the value is 1, press ∨ to select [OFF].

```
          Relay Setting
CH1 3 DO          DOS-20
      On Delay Setting



              1 min.
```

When a value outside the set range is entered, a short
beep sounds.

Press 〈 〉 simultaneously while entering a value
to reset to the factory default setting.

By pressing ⌂ or ⏎BACK, the value returns to the one
before changing it.

The display returns to the setting item selection
menu.

Relay Setting

● Off Delay (cancel timer)

Set a time period to cancel alarm output after a measurement value falls under (or exceeds) the alarm hysteresis.

	Setting range	Factory default setting
Off Delay	OFF 1 to 120 minutes	OFF

1 **In the setting item selection menu, select [Off Delay] using ∧ ∨, and press ENTER.**

```
         Relay Setting
CH1

Output Item    Hysteresis
 3 DO
Trigger        On Delay
   High Alarm       OFF
Active Level   Off Delay
      5.00mg/L      OFF
```
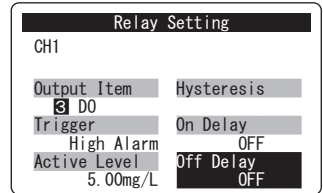
2 **Select a digit by ⟨ ⟩ and value by ∧ ∨, and press ENTER.**

• The initial setting is [OFF]. Pressing ∧ displays the Off delay input display.
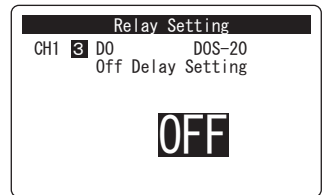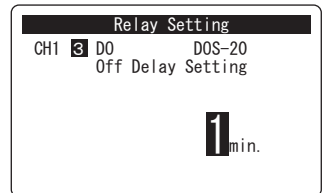
```
         Relay Setting
CH1  3 DO        DOS-20
    Off Delay Setting


         OFF
```

• When the value is 1, press ∨ to select [OFF].

```
         Relay Setting
CH1  3 DO        DOS-20
    Off Delay Setting


             1 min.
```

When a value outside the set range is entered, a short beep sounds.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or BACK, the value returns to the one before changing it.
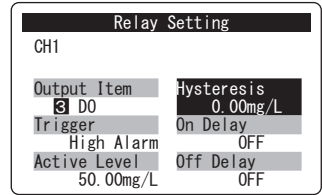
The display returns to the setting item selection menu.

◆ Maintenance output setting

Set a maintenance timer for any cycle ("Maintenance Timer" P.70) to notify the user when the set cycle has elapsed.

This is used for notification of sensor maintenance, replacement of consumables, and overhaul timing.

Notifications can be checked by the relay output and the cloud server (when connected to the GW). For more information about checking notifications on the cloud server, refer to the cloud server's help.

Caution	To select the maintenance output as a relay output item, refer to "Maintenance Timer" P.70 to configure the output cycle (days) before configuring the following setting. After setting, the maintenance output can be selected as an output item of the relay.

1 **On the channel selection display, switch between pages using 〈 〉 , select a channel to set using ∧ ∨ , and press ENTER.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
         Relay Setting

       Channel Select
     Output Item Trig.  Level
 CH1:  OFF
 CH2: 3 DO        High   8.00mg/L
 CH3: 3 DO        Low    5.00mg/L
 CH4: 3 Sens Cap.               =>
```
Output item
Sensor channel

2 **Select [Output Item] using ∧ ∨ , and press ENTER.**

The current setting value is displayed.

```
         Relay Setting
 CH1


 Output Item
    OFF
```
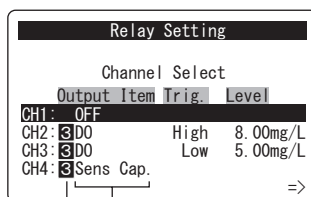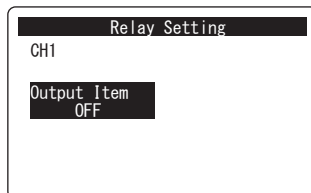
3 **Switch between pages using 〈 〉 , select [Maint.] of a sensor channel to set maintenance output using ∧ ∨ , and press ENTER.**

If output is unnecessary, select [OFF] and press ENTER.

Available display items depend on an installed sensor.

The set sensor channel and [Maint.] are displayed in [Output Item].

```
         Relay Setting
 CH1
        Output Item Select
   3 Maint.      DOS-20
   3 Sens. Cap   DOS-20
   3 Cleaning    DOS-20
     Self Check
 <=
```
Output   Sensor
item   model
Sensor channel

```
         Relay Setting
 CH1


 Output Item
   3 Maint.
```
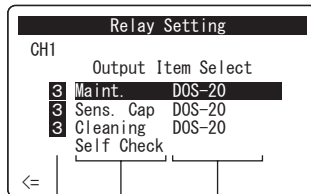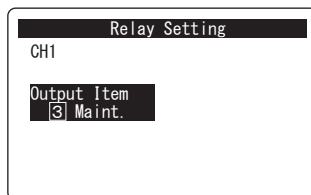
◆ **Cleaning output setting**

Set the cleaning device to operate with relay output.

Caution	To select the cleaning output as a relay output item, refer to the following sections before configuring the setting. • "Cleaning Interval (Relay)" P.76 • "Cleaning Activation" P.77 • "Post-cleaning Standby" P.78 After setting, the cleaning output can be selected as an output item of the relay.

1 **On the channel selection display, switch between pages using ⟨ ⟩, select a channel to set using ∧ ∨, and press ENTER.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
         Relay Setting

      Channel Select
     Output Item Trig. Level
CH1:  OFF
CH2: 3 DO          High   8.00mg/L
CH3: 3 DO          Low    5.00mg/L
CH4: 3 Sens Cap.
                              =>
```

Output item

Sensor channel

2 **Select [Output Item] using ∧ ∨, and press ENTER.**

The current setting value is displayed.

```
         Relay Setting
CH1

Output Item
   OFF
```
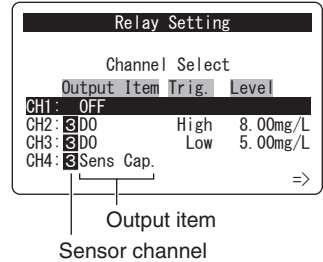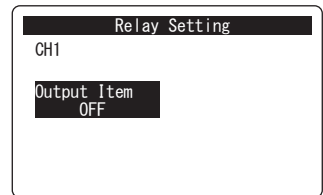
3 **Switch between pages using ⟨ ⟩, select [Cleaning] of a sensor channel to set cleaning output using ∧ ∨, and press ENTER.**

If output is unnecessary, select [OFF] and press ENTER.

Available display items depend on an installed sensor.

The set sensor channel and [Cleaning] are displayed in [Output Item].

```
         Relay Setting
CH1
      Output Item Select
   3 Maint.     DOS-20
   3 Sens. Cap  DOS-20
   3 Cleaning   DOS-20
     Self Check
<=
```

Output   Sensor
item   model

Sensor channel

```
         Relay Setting
CH1

Output Item
 3 Cleaning
```
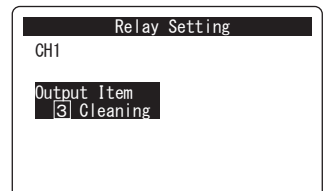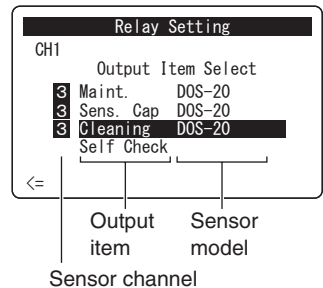
◆ Self Checking output setting

Set an output when an error such as sensor failure and disconnection occurs.

1 **On the channel selection display, switch between pages using** `<` `>` **, select a channel to set using** `∧` `∨` **, and press** ENTER **.**

The setting item selection menu is displayed and the current setting of the selected channel is displayed.

```
          Relay Setting

        Channel Select
      Output Item Trig.  Level
  CH1:  OFF
  CH2: ❸DO          High   8.00mg/L
  CH3: ❸DO          Low    5.00mg/L
  CH4: ❸Sens Cap.
                              =>
```

Output item

Sensor channel

2 **Select [Output Item] using** `∧` `∨` **, and press** ENTER **.**

The current setting value is displayed.

```
          Relay Setting
  CH1

  Output Item
    OFF
```
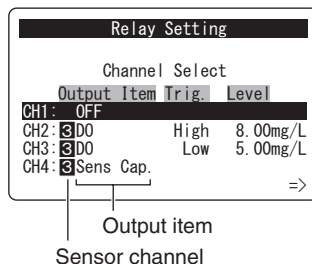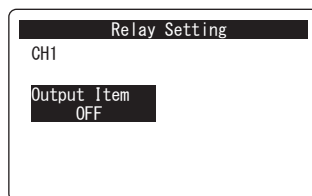
3 **Switch between pages using** `<` `>` **, select [Self Check] using** `∧` `∨` **, and press** ENTER **.**

If output is unnecessary, select [OFF] and press ENTER **.**

Available display items depend on an installed sensor.
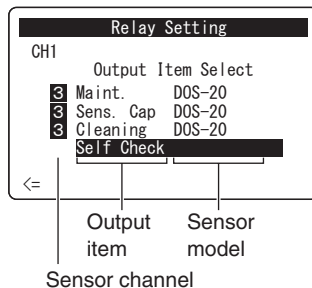
[Self Check] is displayed in [Output Item].

```
          Relay Setting
  CH1
        Output Item Select
    ❸ Maint.      DOS-20
    ❸ Sens. Cap   DOS-20
    ❸ Cleaning    DOS-20
    Self Check
  <=
```

Output   Sensor
item   model

Sensor channel

```
          Relay Setting
  CH1

  Output Item
    Self Check
```
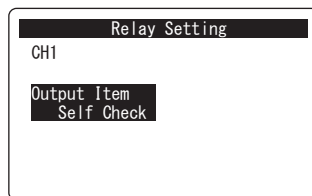
Relay Setting

Relay test mode

Switch the relay ON/OFF and check the output status to the control panel.

1 **On the channel selection display,**

press > **to switch between pages.**

```
        Relay Setting

      Channel Select
   Output Item Trig.  Level
CH1:  OFF
CH2: 3DO        High   8.00mg/L
CH3: 3DO        Low    5.00mg/L
CH4: 3Sens Cap.
                           =>
```

2 **Select [Relay Test Mode], and press** ENTER**.**

The relay test mode menu is displayed.

```
        Relay Setting


      Relay Test Mode


<=
```

Relay Setting

3 **Select a channel to set using** < >

and output ON/OFF using ∧ ∨**.**

While [ON] is selected, relay output will continue from the selected channel.
In the initial status, ALL (all channels) and OFF (no output) are selected.

```
        Relay Setting

      Relay Test Mode
  ALL  CH1   CH2   CH3   CH4
       CH5   CH6   CH7   CH8

           O F F
           O N
```

When selected as shown to the right, relay output is done from channel 2.

```
        Relay Setting

      Relay Test Mode
  ALL  CH1   CH2   CH3   CH4
       CH5   CH6   CH7   CH8

           O F F
           O N
```

4 **To end the test, press** BACK**.**

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5.5 Main Unit Setting

Set the SC-U1 main unit settings.

Caution | Pressing 🔯 automatically retains the measurement value.

1 Press 🔯.

The setting menu is displayed.

2 Select [Main Unit Setting] using ∧ ∨, and press ENTER.

```
                Setting
          Setting Menu
    Sensor Setting
    GW Setting
    4-20mA Setting
    Relay Setting
    Main Unit Setting
```

The main unit setting menu is displayed.

```
            Main Unit Setting
          Setting Menu
    Data Setting
    Passcode Lock
    LCD Setting
    Language
    Information
    Initialization            =>
```
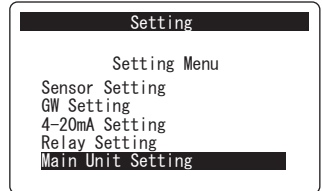
Main Unit Setting
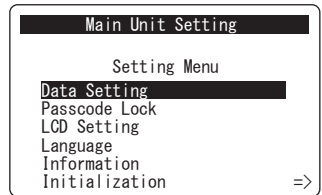
Date setting

Set the date and time (display type) displayed on the status bar when the gateway is connected.

1 **In the Main Unit Setting menu,**

select [Data Setting] using ⌃ ⌄ **,**

and press ENTER.

```
┌─────────────────────────────┐
│     Main Unit Setting        │
│                              │
│       Setting Menu           │
│ Data Setting                 │
│ Passcode Lock                │
│ LCD Setting                  │
│ Language                     │
│ Information                  │
│ Initialization            => │
└─────────────────────────────┘
```
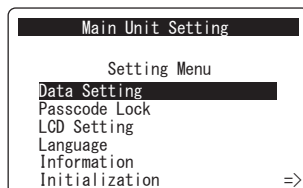
2 **Select a date display type using** ⌃ ⌄ **,**

and press ENTER.

There are three display types:
• yyyy/mm/dd: Year/Month/Day
• dd/mm/yyyy: Day/Month/Year
• mm/dd/yyyy: Month/Day/Year

The indication returns to the main unit setting menu.

```
┌─────────────────────────────┐
│     Main Unit Setting        │
│        Date Setting          │
│                              │
│        yyyy/mm/dd            │
│                              │
│                              │
│                              │
└─────────────────────────────┘
```

Main Unit Setting

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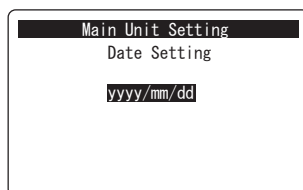
Passcode lock

Disable normal button operations and set passcode lock to prevent unintended operations.
To use passcode lock, configure the following three setting items.

Item	Description	Refer to
Passcode Lock	Set ON/OFF of the passcode lock. The factory default setting is OFF for passcode lock.	P.52
Passcode	Set a passcode to unlock. The initial setting of the passcode is "0000".	P.53
Auto Lock	Set the time to automatically lock the button operations. When the time period specified here has passed while no buttons are operated, the lock is activated.	P.54

Caution	• To unlock the passcode lock, refer to "Unlock passcode" P.18. • If you forgot the passcode, refer to "When in trouble" P.84, "Passcode lock cannot be unlocked".

◆ Passcode lock setting

Set ON/OFF of the passcode lock.

1 **In the Main Unit Setting menu, select [Passcode Lock] using ∧ ∨, and press ENTER.**

```
        Main Unit Setting

          Setting Menu
    Data Setting
    Passcode Lock
    LCD Setting
    Language
    Information
    Initialization          =>
```

2 **Select [Passcode Lock] using ∧ ∨, and press ENTER.**

```
        Main Unit Setting
          Passcode Lock

    Passcode Lock          OFF
```
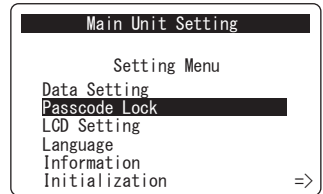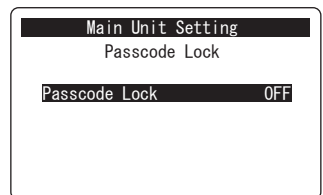
3 **Select [ON] or [OFF] using ∧ ∨, and press ENTER.**

- Selecting [ON] enables the passcode lock.
- Selecting [OFF] disables the passcode lock.

```
        Main Unit Setting
          Passcode Lock


              O N
              O F F
```

52
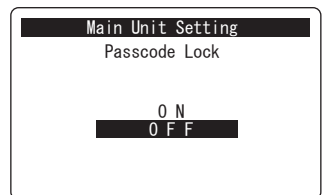
◆ **Passcode**

Set a passcode to unlock.
The factory default setting of the passcode is "0000".

1 **In the Main Unit Setting menu, select**
[Passcode Lock] using ∧ ∨ ,
and press ENTER **.**

```
      Main Unit Setting

         Setting Menu
 Data Setting
 Passcode Lock
 LCD Setting
 Language
 Information
 Initialization              =>
```
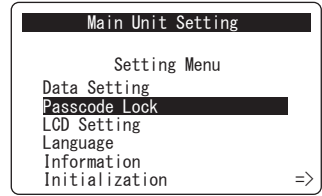
2 **Select [Passcode] using** ∧ ∨ ,
and press ENTER **.**
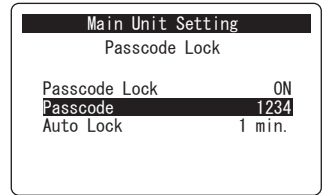
```
      Main Unit Setting
        Passcode Lock

 Passcode Lock          ON
 Passcode             1234
 Auto Lock          1 min.
```

Caution	When passcode lock is OFF, the display is displayed as shown on the right, and passcode cannot be set. The passcode lock must be set as ON ("Passcode lock setting" P.52) before performing operations.

```
      Main Unit Setting
        Passcode Lock

 Passcode Lock         OFF
```
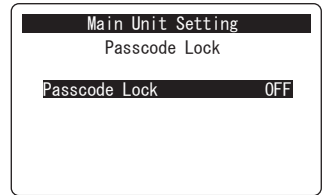
3 **Select a digit by** < > **and a value by**
∧ ∨ **, and press** ENTER **.**

The display returns to the passcode lock setting
menu.

```
      Main Unit Setting
          Passcode


         1234
```

Main Unit Setting

53
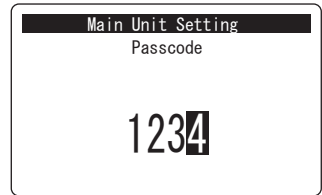
◆ Auto lock

Set the time to automatically lock the button operations.
After unlocking, the lock will be turned ON after the time set here has elapsed and the display returns to the measurement value display.

	Setting range	Factory default setting
Auto Lock	1 to 120 minutes	1 minute

1 **In the Main Unit Setting menu, select [Passcode Lock] using** $\wedge$ $\vee$ **, and press** ENTER **.**

```
      Main Unit Setting

        Setting Menu
Data Setting
Passcode Lock
LCD Setting
Language
Information
Initialization            =>
```
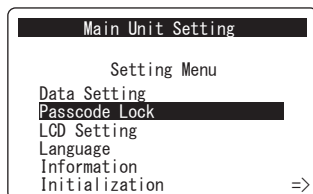
2 **Select [Auto Lock] using** $\wedge$ $\vee$ **, and press** ENTER **.**
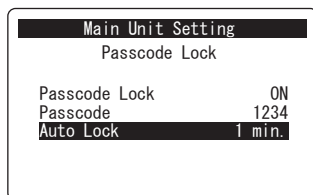
```
      Main Unit Setting
        Passcode Lock

Passcode Lock           ON
Passcode              1234
Auto Lock            1 min.
```

Caution	When passcode lock is OFF, the display is displayed as shown on the right, and passcode cannot be set. The passcode lock must be set as ON ("Passcode lock setting" P.52) before performing operations.

```
      Main Unit Setting
        Passcode Lock

Passcode Lock          OFF
```
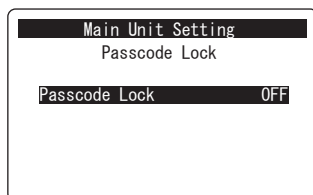
3 **Input a value using** $\wedge$ $\vee$ **, and press** ENTER **.**

When a value outside the set range is entered, a short beep sounds.

Press $<$ $>$ simultaneously while entering a value to reset to the factory default setting.

By pressing $\bigcirc$ or $\overset{\rightleftarrows}{_{BACK}}$, the value returns to the one before changing it.

The display returns to the passcode lock setting menu.

```
      Main Unit Setting
         Auto Lock


          1 min.
```

Main Unit Setting
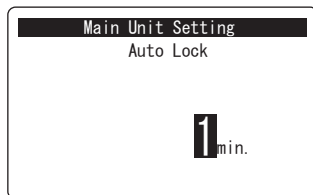
LCD setting

Adjust display contrast and set the backlight setting.

Item	Description	Refer to
Contrast	Set the contrast for the display unit.	P.55
Backlight	Set ON or OFF of the display backlight and the brightness when it is ON.	P.56
Backlight Timer	Set the backlight ON time after button operations.	P.57

◆ Contrast setting

1 **In the Main Unit Setting menu, select [LCD Setting] using ∧ ∨, and press ENTER.**

```
Main Unit Setting

        Setting Menu
Data Setting
Passcode Lock
LCD Setting
Language
Information
Initialization              =>
```
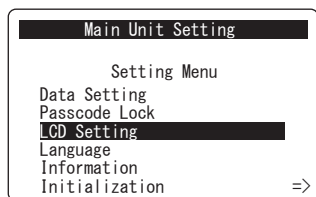
2 **Select [Contrast] using ∧ ∨, and press ENTER.**

```
Main Unit Setting
    LCD Setting

Contrast          10
Backlight         High
Backlight Timer   1 min.
```
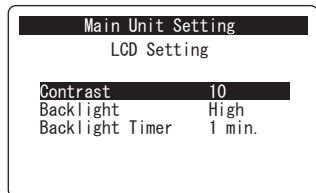
3 **Adjust the contrast by changing the value using ∧ ∨ while watching the display, and press ENTER.**

The adjustment range is 1 to 20.
The display returns to the LCD display setting menu.

```
Main Unit Setting
   Contrast


      10
```

Main Unit Setting

55
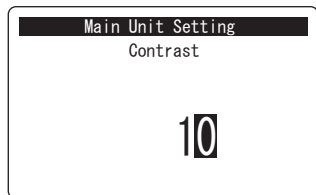
◆ **Backlight setting**

Set ON or OFF of the display backlight and the brightness when it is ON.

1 **In the Main Unit Setting menu, select [LCD Setting] using ∧ ∨, and press ENTER.**

```
Main Unit Setting

     Setting Menu
Data Setting
Passcode Lock
LCD Setting
Language
Information
Initialization            =>
```
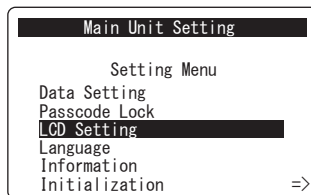
2 **Select [Backlight] using ∧ ∨, and press ENTER.**

```
Main Unit Setting
     LCD Setting

Contrast          10
Backlight         High
Backlight Timer   1 min.
```
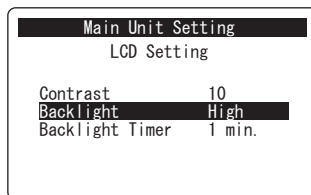
3 **Select a setting using ∧ ∨, and press ENTER.**

The backlight dims in order of [High], [Mid], and [Low].
[OFF] sets the backlight OFF.

```
Main Unit Setting
     Backlight

          High
          Mid
          Low
          OFF
```

Brightness	Backlight setting
Bright ↕ Dark	High
	Mid
	Low
OFF	
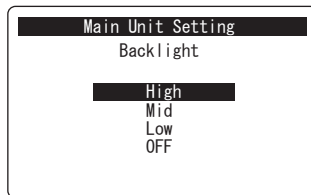
The display returns to the LCD display setting menu.

Main Unit Setting

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◆ Backlight Timer

Set the backlight ON time.
If no operation continues for the time set by the backlight timer, the backlight will be turned off automatically.
Press any button while the backlight is off to turn on the backlight.

	Setting range	Factory default setting
Backlight Timer	1 to 60 minutes	1 minute

1 **In the Main Unit Setting menu, select [LCD Setting] using** ∧ ∨ **, and press** ENTER **.**

```
        Main Unit Setting

          Setting Menu
     Data Setting
     Passcode Lock
     LCD Setting
     Language
     Information
     Initialization          =>
```
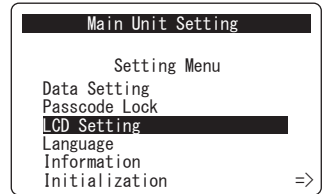
2 **Select [Backlight Timer] using** ∧ ∨ **, and press** ENTER **.**
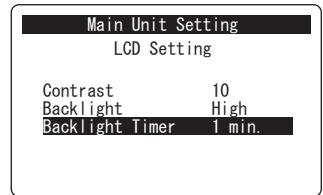
```
        Main Unit Setting
          LCD Setting

     Contrast          10
     Backlight         High
     Backlight Timer   1 min.
```

3 **Select a digit by** ⟨ ⟩ **and value by** ∧ ∨ **, and press** ENTER **.**

When a value outside the set range is entered, a short beep sounds.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⮐BACK, the value returns to the one before changing it.

The display returns to the LCD display setting menu.

```
        Main Unit Setting
         Backlight Timer



              1min.
```

57
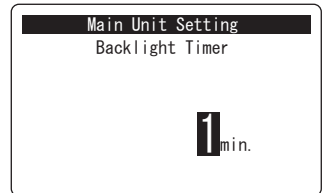
Language

Set the display language setting.

1 **In the Main Unit Setting menu, select [Language] using ,
and press** ENTER**.**

```
     Main Unit Setting

        Setting Menu
  Data Setting
  Passcode Lock
  LCD Setting
  Language
  Information
  Initialization        =>
```
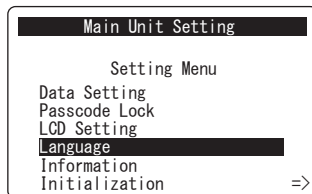
2 **Select a display language using ,
and press** ENTER**.**

The display returns to the main unit setting menu.

```
     Main Unit Setting
         Language


          日本語
          English
```

Information

Display the information of the installed sensor, gateway and SC-U1.

1 **In the Main Unit Setting menu, select
[Information] using , and press**
ENTER**.**

```
     Main Unit Setting

        Setting Menu
  Data Setting
  Passcode Lock
  LCD Setting
  Language
  Information
  Initialization        =>
```
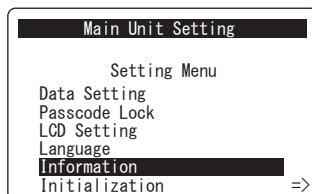
The information of the installed sensor, gateway
and SC-U1 is displayed.

```
     Main Unit Setting
        Information
  1 SE-pH-D      xxxxxxxxxxxxx
  2 TC-3000-D    xxxxxxxxxxxxx
  3 DOS-20       xxxxxxxxxxxxx
  4
  GW             xxxxxxxxxxxxx
  S/N xxxxxxxxxxxxx
  F/W xxx       P/V xxx
```
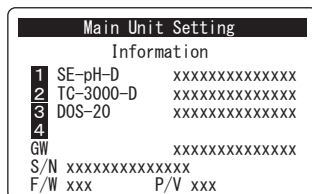
2 **To end the display, press** BACK**.**

The display returns to the main unit setting menu.

Initialization (Restore to factory default setting)

Initialize all settings.

**1 In the Main Unit Setting menu,
select [Initialization] using ∧ ∨,
and press ENTER.**

```
       Main Unit Setting

          Setting Menu
 Data Setting
 Passcode Lock
 LCD Setting
 Language
 Information
 Initialization              =>
```
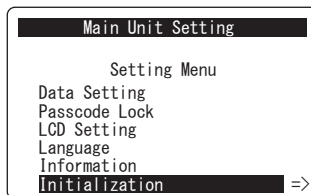
**2 Select [NO] or [YES] using ∧ ∨,
and press ENTER.**

- When [YES] is selected, initialization is
  performed.
- Selecting [NO] cancels initialization and returns
  to the main unit setting menu.

During initialization a progress bar is displayed.
When complete, SC-U1 restarts.

```
       Main Unit Setting
         Initialization

              N O
              Y E S
```

```
       Main Unit Setting
         Initialization
```
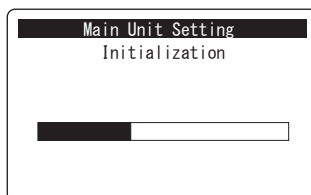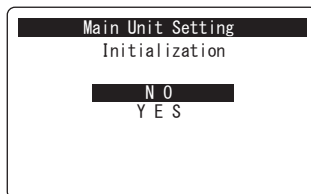
Buzzer Setting

Set the buzzer sound ON/OFF.

**1 In the Main Unit Setting menu, press >
to switch between pages, select [Buzzer

Setting], and press ENTER.**

```
       Main Unit Setting

          Setting Menu

 Buzzer Setting


<=
```
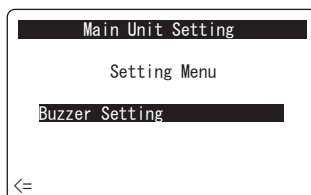
**2 Select [ON] or [OFF] using ∧ ∨,
and press ENTER.**

- Selecting [ON] enables the buzzer.
- Selecting [OFF] disables the buzzer and will not
  sound at all.

The display returns to the main unit setting menu.

```
       Main Unit Setting
         Buzzer Setting

              O F F
              O N
```

Main Unit Setting
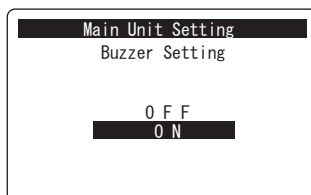
6 Calibration ‹Sensor›

Calibration

The sensor should be calibrated before use or after cleaning.

	• Pressing $\bigoplus_{CAL}$ automatically retains the measurement value.
Caution	• Depending on the sensor to use, the displayed calibration items and operations may vary. For details, refer to the instruction manual for each sensor.

Item	Description	Refer to
ZERO Cal.	The sensor is immersed in distilled or deionized water and the measurement value is adjusted to the reference value (zero).	P.60
SPAN Cal.	The span is adjusted to the predetermined reference value.	Sensor's instruction manual
1-Point Cal.	The sensor's measurement value is adjusted to the predetermined 1-point reference value.	
2-Point Cal.	The sensor's two measurement values are adjusted to the predetermined two reference values.	
Optional Density	The sensor is immersed in liquid with certain density and the measurement value is adjusted to the density.	
Initialize Calibration Value	The calibration value is reset to the factory default setting.	P.62

◆ Example: Zero calibration using turbidity checker

Calibration details depend on a sensor. Refer to each sensor's instruction manual.

1 **Clean the sensor's main unit and detection window.**

2 **Immerse the sensor in distilled or deionized water.**

Caution	If neither distilled water nor deionized water is available, tap water without rust/turbidity can be used instead.
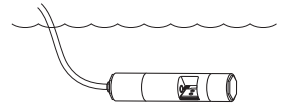
3 **Allow the sensor to acclimate to the water temperature for about 5 minutes, and check that there are no bubbles in the detection window.**

4 **Press $\bigoplus_{CAL}$.**

The sensor selection display is displayed.

Calibration

5 **Select a sensor to calibrate using** ∧ ∨ **, and press** ENTER **.**

In this example, a channel connected to the turbidity checker is selected.
The calibration menu is displayed.

```
Calibration

     Sensor Select
 1 pH          SE-pH-D
 2 Turb.       TC-3000-D
 3 DO          DOS-20
 4
```

Measurement Sensor
item   model
Sensor channel
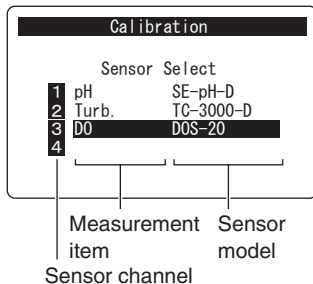
6 **Select a calibration type using** ∧ ∨ **, and press** ENTER **.**

In this example, [ZERO Cal.] is selected.

```
Calibration
 2 Turb.       TC-3000-D

ZERO Cal.
```
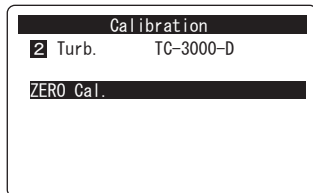
The calibration starts.
During calibration a processing display is displayed.

```
Calibration
 2 Turb.       TC-3000-D
     ZERO Calibration

         Running

       ■□□□□
```
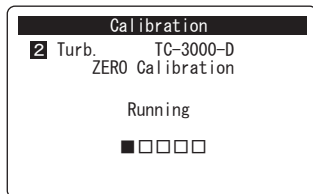
When the calibration is complete, a progress bar is displayed and then the calibration result is displayed.

```
Calibration
 2 Turb.       TC-3000-D
     ZERO Calibration


```
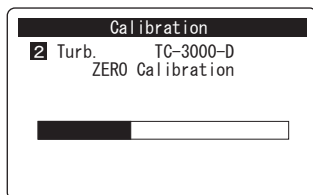
Calibration

7 **When the calibration is complete, check the result.**

```
Calibration
 2 Turb.       TC-3000-D
     ZERO Calibration
        good
```

```
Calibration
 2 Turb.       TC-3000-D
     ZERO Calibration
        E4100
```
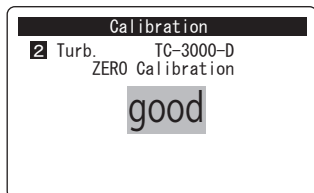
good:
The calibration is properly completed.
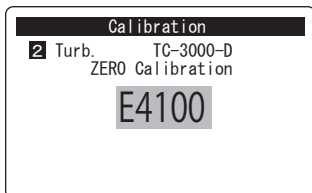
E4100 to 4199:
Calibration failed.
Retry the steps from **1** .

Pressing the ENTER or BACK switches to the measurement value display.

◆Initialize Calibration Value

Initialize the calibration value.

1 **Press** $\bigoplus_{\text{CAL}}$ **.**

The sensor selection display is displayed.

2 **Select a sensor to initialize using** $\boxed{\wedge}$ $\boxed{\vee}$ **, and press** ENTER **.**

The calibration menu is displayed.

```
          Calibration

        Sensor Select
 1 pH        SE-pH-D
 2 Turb.     TC-3000-D
 3 DO        DOS-20
 4
```

Measurement   Sensor
item   model
Sensor channel
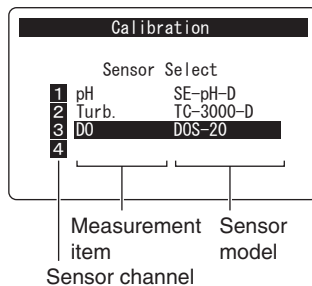
3 **Select [Initialize Calibration Value] using** $\boxed{\wedge}$ $\boxed{\vee}$ **, and press** ENTER **.**

The calibration initialization menu is displayed.

```
          Calibration
 3 Turb.       DOS-20

 1-Point Cal.          DO
 2-Point Cal.          DO
 Optional Density      DO
 Initialize Calibration Value
```
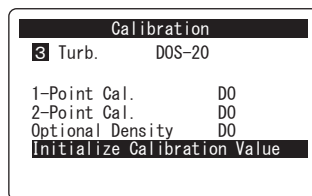
4 **Select [NO] or [YES] using** $\boxed{\wedge}$ $\boxed{\vee}$ **, and press** ENTER **.**

- Selecting [YES] executes initialization and displays a progress bar.
- Selecting [NO] cancels initialization and returns to the calibration menu.

During initialization a progress bar is displayed. When completed, the indication returns to the measurement value display.
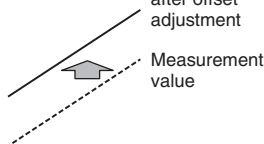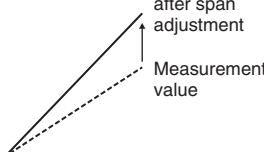
```
          Calibration
 3 DO          DOS-20
  Initialize Calibration Value

              N O
              Y E S
```

```
          Calibration
 3 DO          DOS-20
  Initialize Calibration Value



  ▬▬▬▬▬▬▬▬
```

Calibration

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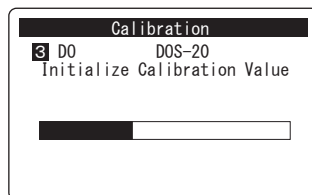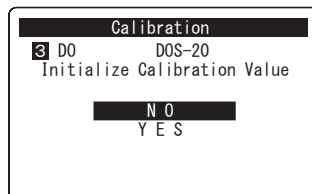
7 Adjustment 〈Sensor〉

Adjustment
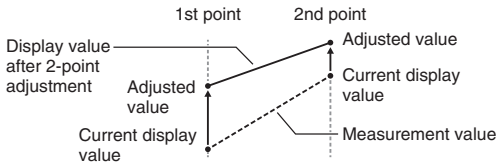
The measurement values can be adjusted and displayed according to usage.
In addition, the measurement values can be adjusted and displayed according to the environment where used.
The following adjustment items can be used.

Caution	• Pressing 〔+/−ADJUST〕 automatically retains the measurement value. • Available adjustment items depend on a sensor. For details, refer to each sensor's instruction manual. • For 4-20 mA output ("4-20 mA setting (4-20 mA output item setting)" P.32) and alarm output ("Alarm output setting" P.40), the adjusted values are applied. • When a display item is changed, the values set on "Offset Adjustment", "Span Adjustment" and "2-Point Adjustment" for which the display items have been set return to the factory default values. Set again if necessary.

Item	Description		Refer to
Offset Adjustment	Offset coefficient to add to a measurement value can be set. The measurement value can be displayed with offset-adjusted to any display value.	Display value after offset adjustment Measurement value	P.65
Span Adjustment	Span coefficient for a measurement value can be set. The measurement value can be displayed with span-adjusted to any display value.	Display value after span adjustment Measurement value	Sensor's instruction manual

Adjustment

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Item	Description	Refer to
2-Point Adjustment	Current values of the two points can be displayed as any adjustment values, respectively. Performing 2-point adjustment changes the offset and span based on the adjusted values. **Caution** If offset, span, or 2-point adjustment has already been performed, be sure to initialize the adjustment before performing the 2-point adjustment.	Sensor's instruction manual
Initialize Adjustment Value	Initialize the adjustment value and return it to the factory default value.	
Salinity Adjustment	Adjust for correct measurement with a salty solution.	
Altitude Adjustment	Adjust for correct measurement and calibration at high altitude.	

◆ Example: Offset adjustment using turbidity checker

1 ▶ **Press** ![ADJUST].

The measurement item selection display is displayed.

2 ▶ **Use** ![∧] ![∨] **to select the item for offset adjustment and press** ENTER.

The pages can be switched ![<] ![>].

The adjustment menu is displayed.

```
              Adjust

   Measurement Item Select
 1 pH          SE-pH-D
 2 Turb.       TC-3000-D
 3 DO          DOS-20
 3 Temp.       DOS-20


        Measurement  Sensor
        item         model
   Sensor channel
```
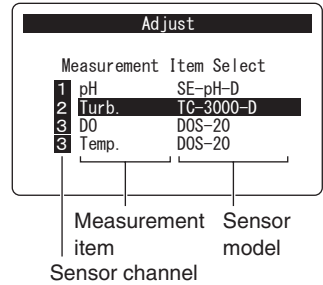
3 ▶ **Select [Offset Adjustment] using** ![∧] ![∨]**, and press** ENTER.

The correction items to display depends on a sensor.

```
              Adjust
 2 Turb.       TC-3000-D

Offset Adjustment    0.0 FTU
Span Adjustment      1.00
2-Point Adjustment
Initialize Adjustment Value
```
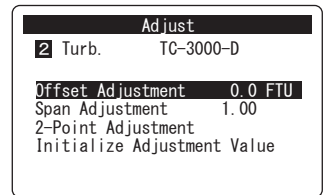
4 ▶ **Enter the offset value.**

Select a digit by ![<] ![>] **and value by** ![∧] ![∨]**, and press** ENTER.

When a value outside the set range is entered, a short beep sounds.

Press ![<] ![>] simultaneously while entering a value to reset to the factory default setting.

By pressing ![⌂] or ![BACK], the value returns to the one before changing it.

During adjustment a progress bar is displayed. When completed, the display returns to the measurement value display.

```
              Adjust
 2 Turb.       TC-3000-D
      Offset Adjustment


        0. 0 FTU
```

```
              Adjust
 2 Turb.       TC-3000-D
      Offset Adjustment


   [███████         ]
```

Adjustment

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8 Maintenance Setting ‹Sensor›

Maintenance

Set the sensor maintenance settings.

Caution	Pressing 🔧 automatically retains the measurement value.

1 ▶ Press ⁺⁄₋.

The sensor selection display is displayed.

2 ▶ Select a sensor to set using ∧ ∨, and press ENTER.

By selecting [ALL], all of the installed sensors can be selected.

```
                Maintenance

           Sensor Select
        1 pH          SE-pH-D
        2 Turb.       TC-3000-D
        3 DO          DOS-20

          ALL
```

Output item / Sensor model
Sensor channel
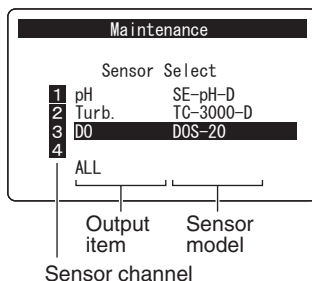
The maintenance menu is displayed.
Available display items depend on a sensor.

```
                Maintenance
        3 DO          DOS-20

                   HOLD
        HOLD Timer            10 min.
        Maintenance Timer    123 days
        Sens. Cap Replacement 321 days
```
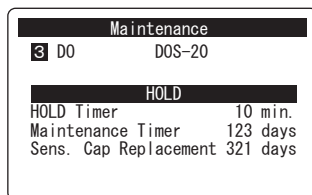
Selecting [ALL] displays [HOLD] only.

```
                Maintenance
          ALL

                   HOLD
```
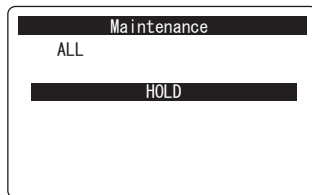
Item	Description	Refer to
HOLD/HOLD CANCEL	The last measurement value is retained (held). This is used for sensor maintenance and cleaning.	P.67
HOLD Timer	Set the time period to hold the measurement value.	P.69
Maintenance Timer	Set a maintenance cycle. Notification can be done using a relay output when the set cycle has elapsed ("Maintenance output setting" P.46).	P.70
Sens. Cap Replacement	Set a replacement cycle for the sensor cap. Notification can be done using a relay output when the set cycle has elapsed.	Sensor's instruction manual

◆ Measurement value hold

● Performing measurement value hold

The last measurement value is retained (held). This is used for sensor maintenance and cleaning.

1 **On the sensor selection display, select a sensor to set using $\wedge$ $\vee$, and press ENTER.**

By selecting [ALL], all of the connected sensors can be selected.

```
           Maintenance

         Sensor Select
  1  pH           SE-pH-D
  2  Turb.        TC-3000-D
  3  DO           DOS-20
  4
     ALL

     Output      Sensor
     item        model
   Sensor channel
```
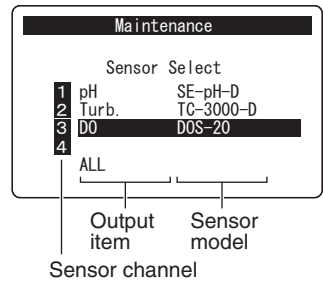
2 **Select [HOLD] using $\wedge$ $\vee$, and press ENTER.**

The measurement value is retained (held) and the display returns to the measurement value display.

```
           Maintenance
  3  DO           DOS-20

              HOLD
  HOLD Timer              10 min.
  Maintenance Timer      123 days
  Sens. Cap Replacement  321 days
```
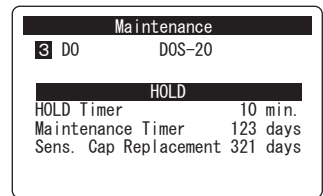
[HOLD] is displayed on the measurement value display for the sensor that is being held.
In addition, "H" is displayed in the maintenance menu.

```
           Maintenance

         Sensor Select
    1  pH           SE-pH-D
    2  Turb.        TC-3000-D
  H 3  DO           DOS-20
    4
       ALL

       Output      Sensor
       item        model
     Sensor channel
```

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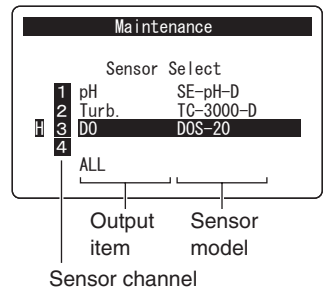
● Canceling measurement value hold

Cancel the measurement value hold of the sensor that is holding the measurement.

1 **On the sensor selection display, use** [∧] [∨] **to select the sensor for which you want to cancel measurement value hold, then press** [ENTER].

By selecting [ALL], all of the connected sensors can be selected.

```
              Maintenance

            Sensor Select
        1  pH         SE-pH-D
        2  Turb.      TC-3000-D
        3  DO         DOS-20
        4
           ALL
```

Output   Sensor
item   model

Sensor channel
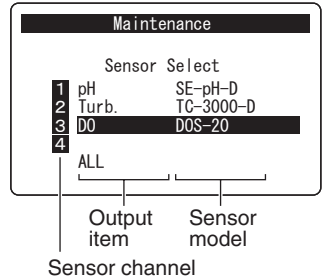
2 **Select [HOLD CANCEL] using** [∧] [∨] **, and press** [ENTER].

The measurement value hold is canceled and the display returns to the measurement value display.
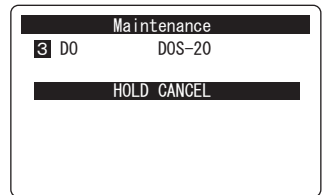
```
              Maintenance
        3  DO         DOS-20

              HOLD CANCEL
```

◆ Hold Timer

Set the time period to hold the measurement value.
The setting range is shown below.

Output Item	Setting range	Factory default setting
HOLD Timer	OFF 10 to 1440 minutes (by 10 minutes)	60 minutes

1 **On the sensor selection display, select a sensor to set using** ∧ ∨ **, and press** ENTER**.**

Hold timer setting must be set for each sensor.
If [ALL] is selected, the setting is not available.

```
          Maintenance

        Sensor Select
   1 pH        SE-pH-D
   2 Turb.     TC-3000-D
   3 DO        DOS-20
   4
     ALL
```

Output item Sensor model
Sensor channel
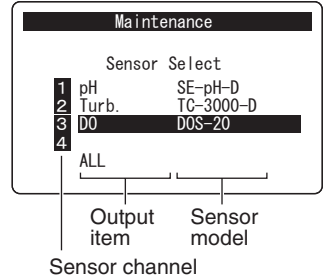
2 **Select [HOLD Timer] using** ∧ ∨ **, and press** ENTER**.**
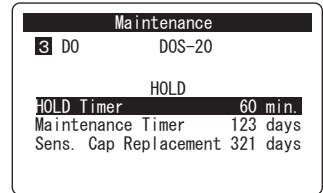
```
          Maintenance
   3 DO          DOS-20

              HOLD
   HOLD Timer            60 min.
   Maintenance Timer    123 days
   Sens. Cap Replacement 321 days
```

3 **Select a digit by** < > **and value by** ∧ ∨ **, and press** ENTER**.**

• When the value is 10, press ∨ to select [OFF].

```
          Maintenance
   3 DO          DOS-20
       HOLD Timer Setting


            10 min.
```
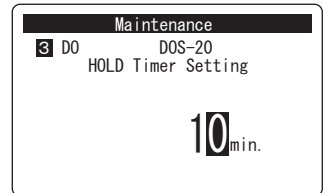
• When [OFF] is set, press ∧ to display the hold timer input display.
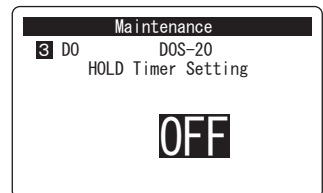
```
          Maintenance
   3 DO          DOS-20
       HOLD Timer Setting


            OFF
```

When a value outside the set range is entered, a short beep sounds.

Press < > simultaneously while entering a value to reset to the factory default setting.

By pressing △ or BACK, the value returns to the one before changing it.

The display returns to the maintenance menu.

Maintenance
Setting

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◆ Maintenance Timer

A maintenance timer can be set to an arbitrary cycle and notified when the set cycle has elapsed.
This is used for notification of sensor maintenance, replacement of consumables, and overhaul timing.
When the maintenance timer has expired, "MAINT" is displayed on the measurement value display of the sensor.

```
2020/07/09                  RLY
12:56
■ DO                           MAINT

             0. 01      mg/L
    20. 0℃
```
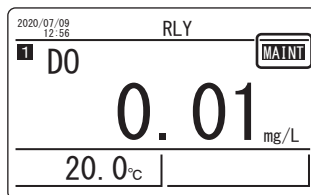
Notifications can be checked by the relay output
("Maintenance output setting" P.46) and the cloud server (when connected to the GW).
For more information about checking notifications on the cloud server, refer to the cloud server's help.

● Setting maintenance timer

Set the maintenance timer.
The setting range is shown below.

Output Item	Setting range	Factory default setting
Maintenance Timer	OFF 7 to 1095 days (by 1 day)	OFF

1 **On the sensor selection display, select a sensor to set using ∧ ∨ , and press ENTER.**

Maintenance timer setting must be set for each sensor.
If [ALL] is selected, the setting is not available.

```
           Maintenance

        Sensor Select
  1 pH          SE-pH-D
  2 Turb.       TC-3000-D
  3 DO          DOS-20
  4
   ALL
```
Sensor channel
Output item
Sensor model

2 **Select [Maintenance Timer] using ∧ ∨ , and press ENTER.**
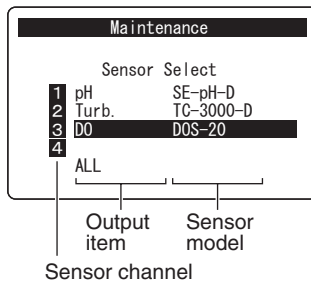
```
            Maintenance
  3 DO          DOS-20

              HOLD
 HOLD Timer              10 min.
 Maintenance Timer          OFF
 Sens. Cap Replacement 321 days
```
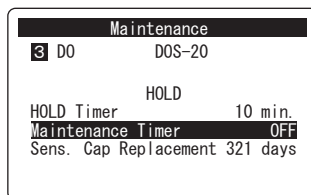
3 **Select [Timer Setting] using ∧ ∨,**
and press ENTER.

The cursor moves to the setting of days.

```
           Maintenance
 3 DO          DOS-20
          Maintenance Timer



Timer Setting          OFF
```

4 **Select a digit by ＜ ＞ and value by**
∧ ∨, and press ENTER.

```
           Maintenance
 3 DO          DOS-20
          Maintenance Timer



Timer Setting        365 days
```
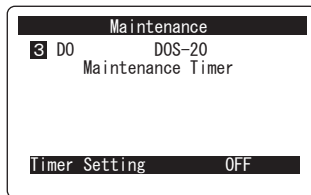
• The factory default setting is [OFF]. Press ∧ to
display the maintenance timer input display.

```
           Maintenance
 3 DO          DOS-20
          Maintenance Timer



Timer Setting          OFF
```
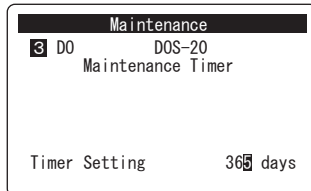
• When the value is 7, press ∨ to select [OFF].

```
           Maintenance
 3 DO          DOS-20
          Maintenance Timer



Timer Setting          7 days
```
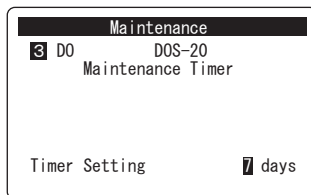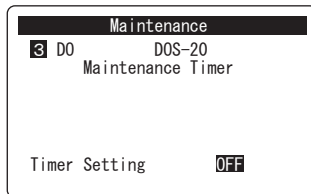
The set days is entered and the display returns to
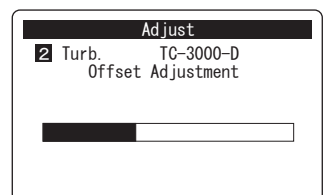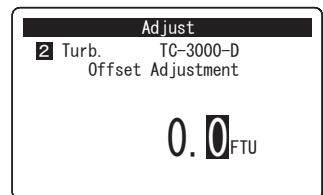the maintenance menu.

When a value outside the set range is entered, a short
beep sounds.

Press ＜ ＞ simultaneously while entering a value
to reset to the factory default setting.

By pressing ⌂ or ⤺BACK, the value returns to the one
before changing it.

5 **Refer to "Maintenance output setting" P.46 to set [Maint.] of the sensor**
for which maintenance timer is set in the output item of relay output.

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● **Canceling maintenance notification**

Cancel the maintenance notification.

1 **On the sensor selection display, select a sensor to set using** ⌃ ⌄ **, and press** ENTER **.**

Maintenance timer setting must be set for each sensor.
If [ALL] is selected, the setting is not available.

```
            Maintenance
         Sensor Select
   1  pH          SE-pH-D
   2  Turb.       TC-3000-D
   3  DO          DOS-20
   4
      ALL
```

Output Sensor
item   model

Sensor channel

2 **Select [Maintenance Timer] using** ⌃ ⌄ **, and press** ENTER **.**

The number of days remaining for the configured maintenance timer is displayed to the right of the maintenance timer.

```
            Maintenance
   3  DO          DOS-20

                HOLD
   HOLD Timer            10 min.
   Maintenance Timer     123 days
   Sens. Cap Replacement 321 days
```
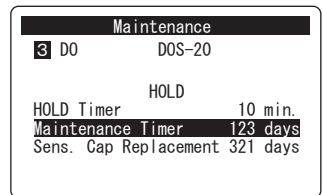
3 **Select [Timer Clear] using** ⌃ ⌄ **, and press** ENTER **.**

```
            Maintenance
   3  DO       DOS-20
          Maintenance Timer

   remaining    123 days

   Timer Clear
   Timer Setting        365 days
```

The maintenance notification is canceled and the remaining days are reset to the number of days set in the maintenance timer setting.
The display returns to the maintenance menu.

```
            Maintenance
   3  DO          DOS-20

                HOLD
   HOLD Timer            10 min.
   Maintenance Timer     365 days
   Sens. Cap Replacement 321 days
```
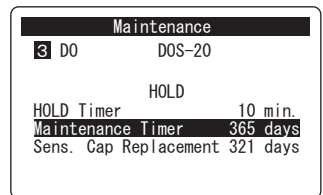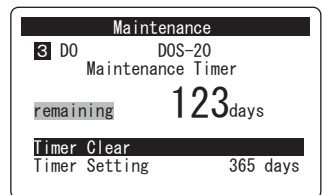
9   Cleaning ‹Sensor›

Cleaning

Set the sensor cleaning settings.

Caution	Pressing 🔆 automatically retains the measurement value.

1 **Press 🔆.**

The sensor selection display is displayed.

2 **Select a sensor to set using ∧ ∨,**

and press ENTER.

The cleaning menu is displayed.
By selecting [ALL], all of the installed sensors can be selected.
Shown below are available items.

```
                    Cleaning

                 Sensor Select
      1 pH            SE-pH-D
      2 Turb.         TC-3000-D
      3 DO            DOS-20
      4
        ALL
```
Output item Sensor model
Sensor channel
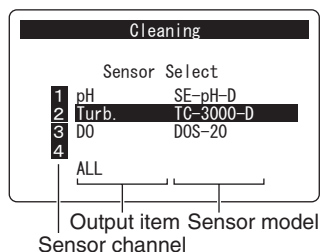
Caution	Available items depend on a sensor.

Item	Description	Refer to
Manual Cleaning	The wiper and cleaning device can be manually activated. The measurement value of the target sensor is retained (held) during cleaning.	P.74
Shown below is the setting to automatically activate the wiper of the sensor.		
Cleaning Interval	Set a time interval to activate the wiper.	P.75

Cleaning	Cleaning not performed	Cleaning	Cleaning not performed
One round trip of wiper blade	Cleaning interval	One round trip of wiper blade	Cleaning interval
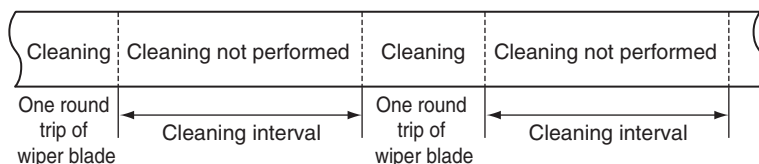
- The setting time for the cleaning interval is the time interval between the end of cleaning and the next cleaning.
- The cleaning action is fixed at one wiper blade round trip per cycle.

Cleaning

Item	Description	Refer to
Shown below are the settings to activate the cleaning device using a relay output ("Cleaning output setting" P.47).		
Cleaning Interval (Relay)	Set the time interval between cleaning actions.	P.76
Cleaning Activation	Set the time period for cleaning. The last measurement value is retained (held) during cleaning.	P.77
Post-cleaning Standby	Set the standby time after cleaning. The measurement value is retained (held) during post-cleaning standby.	P.78
The settings work as shown below:		

◆ Manual Cleaning

The wiper and cleaning device can be manually activated. The cleaning device can be activated only if the cleaning output has been set using relay output.
The measurement value of the target sensor is retained (held) during cleaning.

1 On the sensor selection display, select a sensor to set using [∧] [∨], and press [ENTER].

The cleaning menu is displayed.
By selecting [ALL], all of the connected sensors can be selected.

Output item Sensor model
Sensor channel
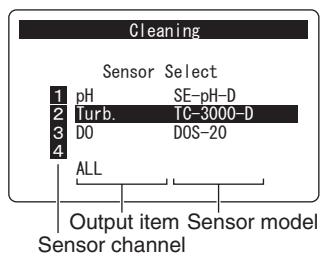
2 Select [MANUAL CLEANING] using [∧] [∨], and press [ENTER].

The cleaning device is activated and the display returns to the measurement value display.
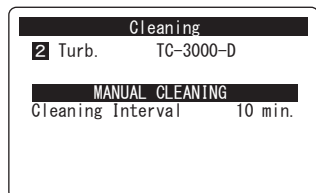
The sensor under cleaning shows "CLEAN" on the measurement value display.
In addition, "C" is displayed in the sensor selection display.
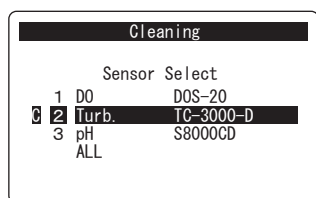
Cleaning

◆ Cleaning Interval

Set a time interval to activate the wiper.
The setting range is shown below.

Item	Setting range	Factory default setting
Cleaning Interval	OFF (No cleaning) 10 to 1440 minutes (by 10 minutes)	30 minutes

1 **On the sensor selection display, select a sensor to set using ∧ ∨ , and press ENTER.**

The cleaning menu is displayed.
Cleaning interval setting must be set for each sensor.
If [ALL] is selected, the setting is not available.

```
                  Cleaning

             Sensor Select
        1 pH          SE-pH-D
        2 Turb.       TC-3000-D
        3 DO          DOS-20
        4
          ALL
```
Output item Sensor model
Sensor channel
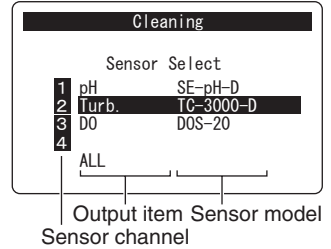
2 **Select [Cleaning Interval] using ∧ ∨ , and press ENTER.**
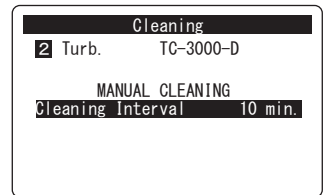
```
                  Cleaning
        2 Turb.      TC-3000-D

             MANUAL CLEANING
        Cleaning Interval    10 min.
```

3 **Select a digit by < > and value by ∧ ∨ , and press ENTER.**

• When the value is 10, press ∨ to select [OFF].

```
                  Cleaning
        2 Turb.      TC-3000-D
              Cleaning Interval


                    10 min.
```

• When [OFF] is set, press ∧ to display the cleaning interval input display.
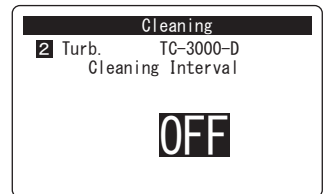
```
                  Cleaning
        2 Turb.      TC-3000-D
              Cleaning Interval


                    OFF
```

When a value outside the set range is entered, a short beep sounds.

Press < > simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or BACK , the value returns to the one before changing it.

The indication returns to the cleaning menu.
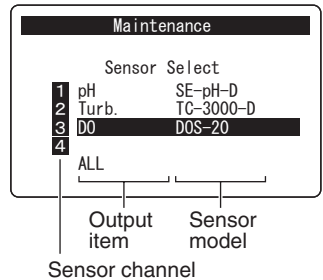
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◆ **Cleaning Interval (Relay)**

Set the time interval between cleaning actions.
The settings are to activate the cleaning device using a relay output ("Cleaning output setting" P.47).
The setting range is shown below.

Output Item	Setting range	Factory default setting
Cleaning Interval (Relay) [Cleaning Interval-RLY]	OFF (No cleaning) 10 to 1440 minutes (by 10 minutes)	30 minutes

1 **On the sensor selection display, select a sensor to set using ∧ ∨, and press ENTER.**

The cleaning menu is displayed.
Cleaning interval (relay) setting must be set for each sensor.
If [ALL] is selected, the setting is not available.

```
                        Cleaning

            Sensor Select
    1 pH          SE-pH-D
    2 Turb.       TC-3000-D
    3 DO          DOS-20
    4
        ALL
```

Output item   Sensor model
Sensor channel
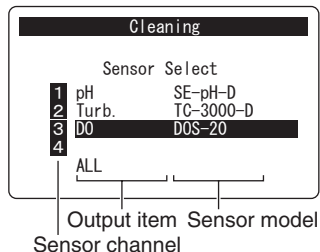
2 **Select [Cleaning Interval-RLY] using ∧ ∨, and press ENTER.**
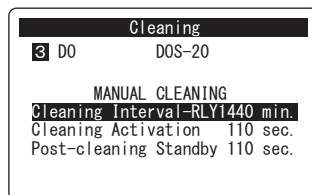
```
                        Cleaning
    3 DO          DOS-20

            MANUAL CLEANING
    Cleaning Interval-RLY1440 min.
    Cleaning Activation    110 sec.
    Post-cleaning Standby 110 sec.
```

3 **Select a digit by ⟨ ⟩ and value by ∧ ∨, and press ENTER.**

• When the value is 10, press ∨ to select [OFF].

```
                        Cleaning
    3 DO          DOS-20
        Cleaning Interval-RLY



                        10 min.
```
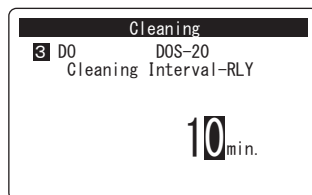
• When [OFF] is set, press ∧ to display the cleaning interval (relay) input display.
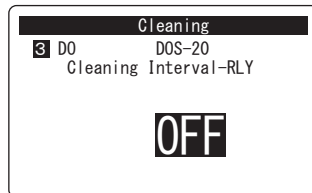
```
                        Cleaning
    3 DO          DOS-20
        Cleaning Interval-RLY



                        OFF
```

When a value outside the set range is entered, a short beep sounds.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⤶BACK, the value returns to the one before changing it.

The display returns to the cleaning menu.

4 ▸ **Refer to "Cleaning output setting" P.47 to set [Cleaning] of the sensor for which cleaning interval is set in the output item of relay output.**

◆ Cleaning Activation

Set the time period for cleaning.
The settings are to activate the cleaning device using a relay output ("Cleaning output setting" P.47).
The measurement value is retained (held) during cleaning.
The setting range is shown below.

Output Item	Setting range	Factory default setting
Cleaning Activation	10 to 120 seconds (by 10 seconds)	30 seconds

1 ▸ **On the sensor selection display, select a sensor to set using** ︿ ﹀ **, and press** ENTER **.**

The cleaning menu is displayed.
Cleaning activation setting must be set for each sensor.
It cannot be set when [ALL] is selected.

```
              Cleaning

        Sensor Select
   1 pH          SE-pH-D
   2 Turb.       TC-3000-D
   3 DO          DOS-20
   4
     ALL
```
Output item Sensor model
Sensor channel
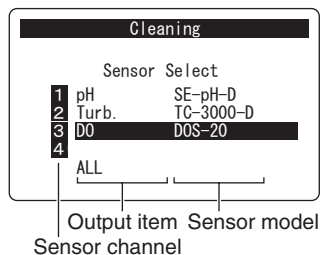
2 ▸ **Select [Cleaning Activation] using** ︿ ﹀ **, and press** ENTER **.**
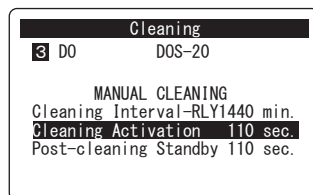
```
              Cleaning
   3 DO          DOS-20

        MANUAL CLEANING
   Cleaning Interval-RLY1440 min.
   Cleaning Activation   110 sec.
   Post-cleaning Standby 110 sec.
```

3 ▸ **Select a digit by** ‹ › **and value by** ︿ ﹀ **, and press** ENTER **.**

When a value outside the set range is entered, a short beep sounds.

Press ‹ › simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⏎BACK, the value returns to the one before changing it.

The display returns to the cleaning menu.

```
              Cleaning
   3 DO          DOS-20
        Cleaning Activation


            110 sec.
```

Cleaning

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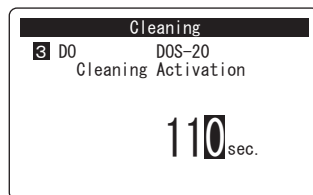
◆ Post-cleaning Standby

Set the standby time after cleaning.
The settings are to activate the cleaning device using a relay output ("Cleaning output setting" P.47).
The measurement value is retained (held) during post-cleaning standby.
The setting range is shown below.

Item	Setting range	Factory default setting
Post-cleaning Standby	10 to 180 seconds (by 10 seconds)	30 seconds

1 **On the sensor selection display, select a sensor to set using ∧ ∨, and press** **ENTER**.

The cleaning menu is displayed.
Post-cleaning standby setting must be set for each sensor.
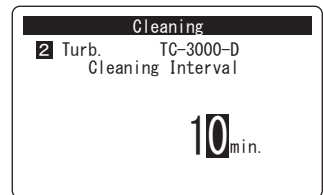If [ALL] is selected, the setting is not available.

```
              Cleaning

         Sensor Select
  1 pH          SE-pH-D
  2 Turb.       TC-3000-D
  3 DO          DOS-20
  4
    ALL
```
Output item Sensor model
Sensor channel
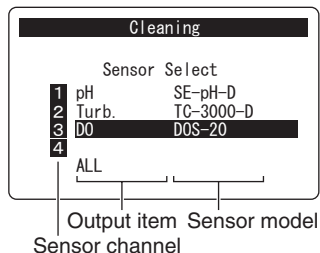
2 **Select [Post-cleaning Standby] using ∧ ∨, and press** **ENTER**.
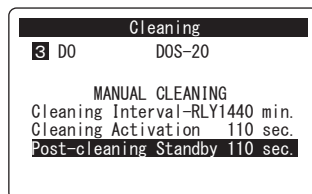
```
              Cleaning
  3 DO          DOS-20

       MANUAL CLEANING
  Cleaning Interval-RLY1440 min.
  Cleaning Activation   110 sec.
  Post-cleaning Standby 110 sec.
```

3 **Select a digit by ⟨ ⟩ and value by ∧ ∨, and press** **ENTER**.

When a value outside the set range is entered, a short beep sounds.

Press ⟨ ⟩ simultaneously while entering a value to reset to the factory default setting.

By pressing ⌂ or ⤺ᴮᴬᶜᴷ, the value returns to the one before changing it.

The display returns to the cleaning menu.

```
              Cleaning
  3 DO          DOS-20
       Post-cleaning Standby


           110 sec.
```
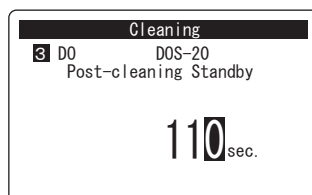
10 Firmware Update

The firmware of the SC-U1 can be updated from a computer using the configuration software for Windows.
The configuration software and firmware update files can be downloaded from the following.
Also for instructions on updating the firmware, refer to the following website.
https://www.optex.co.jp/support/download-water-quality-measurement/transmitter/scu1.html

To update the firmware, connect the SC-U1 and the PC to which the configuration software has been downloaded with a USB cable.
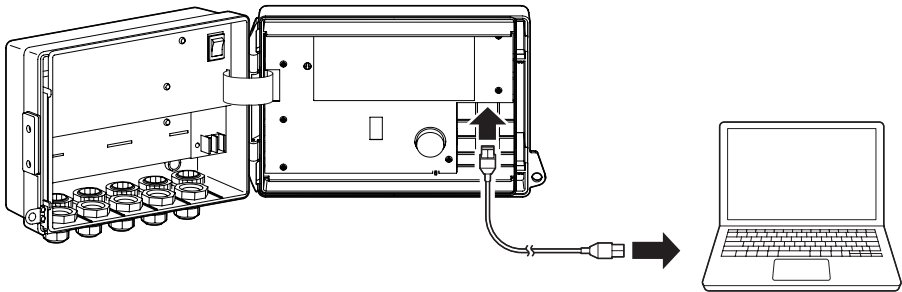
- The product does not include a USB cable. Use a commercial cable.
  The connector type is micro USB Type-B.
- Measurement and output cannot be performed while the product is connected to a computer.
- While being connected to a USB, "USB" is displayed on the display.
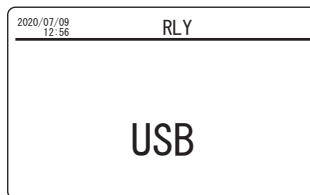
Caution	• Do not unplug the USB cable while the firmware is being updated. Unplugging the cable during the update may prevent SC-U1 from booting.

* Windows is a registered trademark of Microsoft Corporation in the United States and/or other countries.
* Windows stands for Microsoft Windows operating system.

11 Troubleshooting

Error Display

This product has a display function to notify of operation errors and problems.
The display depends on the error details.
For details of error codes, refer to "Error codes" P.82.

Error display position

● Example of display on main display

```
2020/07/09
  12:56        RLY

       E1000
```
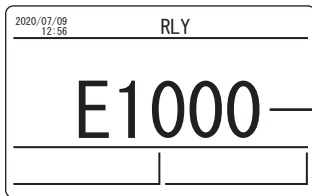
The main display shows the error code. It does not show the sensor channel number.
It is displayed when the sensor is not connected.

● Example of display on main display (2 units connected)

```
2020/07/09
  12:56        RLY
1 Turb.      2 D0
E3000  0. 01
                    mg/L
               20. 0℃
```
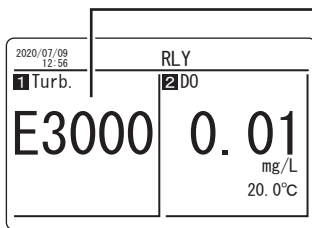
A sensor with an error displays its error code as the main display item.
A sensor without an error displays measurement values as usual.
It is displayed when the sensor is out of order.

● Example of display on sensor status (1 unit connected)

```
2020/07/09
  12:56        RLY
1 D0              M500
       0. 01
                    mg/L
   20. 0℃
```
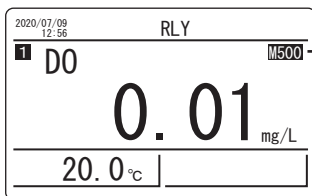
It shows an error code on the sensor status of the sensor in error.
It is displayed when sensor maintenance is required.

● **Example of display on calibration result display**

```
┌─────────────────────────────┐
│      Calibration            │
│ 2 Turb.     TC-3000-D       │
│      ZERO Calibration       │
│                             │
│       E4100                 │
│                             │
│                             │
└─────────────────────────────┘
```
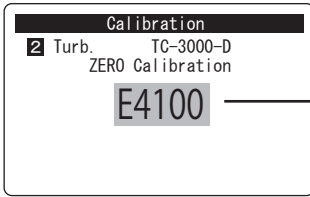
It shows an error code on the calibration result display after calibration is completed.
It is displayed when sensor calibration failed.

● **Example of display when information status is lit**

```
┌──────────────────────┐
│ 2020/07/09    ! RLY   │
│ 12:56                 │
│ 1 DO                  │
│                       │
│    0. 01 mg/L         │
│                       │
│  20. 0 ℃              │
└──────────────────────┘
```
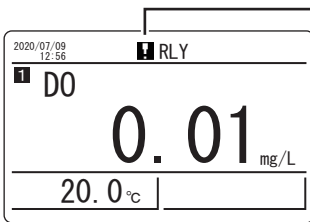
The information status on the status bar is lit.
Error codes can be viewed as in "Information" P.58.

```
┌─────────────────────────────┐
│    Main Unit Setting    ■    │
│        Information    E6000  │
│ 1 DOS-20    xxxxxxxxxxxxxx   │
│ 2                           │
│ 3                           │
│ 4                           │
│ GW          xxxxxxxxxxxxxx   │
│ S/N xxxxxxxxxxxxxx          │
│ F/W xxx     P/V xxx         │
└─────────────────────────────┘
```
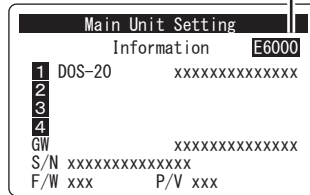
Error codes

◆ Error code list

The types of error codes as well as causes and countermeasures are described below.
In the case of that the error code is still displayed after countermeasures are taken, record the error code as well as model and serial No. affixed inside the battery cover, and contact the dealer.

Error code and details	Cause	Action
E1000 Communications error	The sensor cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The sensor cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The sensor is out of order.	The sensor must be repaired. Contact the dealer.
E2000 Sensor processing/sensor failure	SC-U1 was operated while the sensor was being processed.	The sensor is no longer accepting input from the SC-U1. The display returns to the measurement value after a few seconds.
	The sensor cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The sensor cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The sensor is out of order.	The sensor must be repaired. Contact the dealer.
E3000 to E3999 Sensor failure	Follow "Troubleshooting" in the sensor's instruction manual.	
E4000 to 4999 Calibration error	Follow "Troubleshooting" in the sensor's instruction manual.	
M5xx Sensor maintenance	Refer to "M5xx error code list" P.83.	
E6200 to 6999 Transmitter error	The ambient temperature exceeds the operating temperature of the transmitter.	The ambient usage temperature must be -20 to 50°C.
E6400 to 6499 Transmitter error	There is something wrong with the transmitter.	Press and hold ⌂ for 5 seconds to display the initialization menu. Perform initialization.
	The transmitter is out of order.	If the initialization menu does not appear after pressing and holding ⌂ for 5 seconds, or if the error persists after initialization, the transmitter needs to be repaired, contact the dealer.

◆ M5xx error code list

M5xx error codes are a combination of error codes (1) and (2). 0 (Zero) if no error code is found.

M5xx
— Error code (1)
— Error code (2)
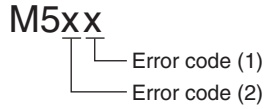
Error codes and their causes and actions are described below.

Error code		Cause			
		Maintenance timing	Calibration timing	Consumables replacement timing	Overhaul timing
(1)	M5x2	✓			
	M5x4		✓		
	M5x6	✓	✓		
	M5x8			✓	
	M5xA	✓		✓	
	M5xC		✓	✓	
	M5xE	✓	✓	✓	
(2)	M51x				✓

Cause	Action
Maintenance timing	Sensor maintenance is required. Follow "Maintenance" in the sensor's instruction manual.
Calibration timing	Calibration of the sensor is required. Refer to "6 Calibration" P.60 and "Calibration" in the sensor's instruction manual for calibration.
Consumables replacement timing	Sensor consumables need to be replaced. Follow "Maintenance" in the sensor's instruction manual.
Overhaul timing	Sensor overhaul timing. Follow "Maintenance" in the sensor's instruction manual.

When in trouble

Error details	Cause	Action
Nothing is displayed on the display.	A power cable is not wired.	Check the internal wiring and be sure to wire correctly.
	The power is off.	Open the cover and turn on the power switch.
	The breaker is engaged.	Remove the cause of the problem and reset the breaker.
	The transmitter is out of order.	The transmitter must be repaired. Contact the dealer.
Displayed characters are hard to see.	The contrast setting is not proper.	Refer to "Contrast setting" P.55 to adjustment.
	The display is not clean.	Refer to "Maintenance (Monthly)" P.89 to perform cleaning.
	The protective film has not been removed.	Remove the protective film from the display.
The display backlight is dark or not lit.	The backlight setting is configured as OFF or Low.	Refer to "Backlight setting" P.56 to change the setting.
	The backlight timer is too short.	Refer to "Backlight Timer" P.57 to change the setting.
	The display is not clean.	Refer to "Maintenance (Monthly)" to perform cleaning.
The display backlight is not lit.	The backlight timer is too long.	Refer to "Backlight Timer" P.57 to change the setting.
Operation buttons do not react.	The passcode lock has been enabled.	When the Locking button icon (🔒) is displayed in the status bar, passcode lock is enabled. Refer to "Unlock passcode" P.18 to unlock the passcode.
	The transmitter is out of order.	The transmitter must be repaired. Contact the dealer.
Passcode lock cannot be unlocked.	The entered passcode is incorrect.	Passcode lock is forcibly unlocked. Use the same measures if you forgot the passcode. Press the buttons ADJUST → SETTING → CLEAN → MAINT → CAL → ENTER in this order within 5 seconds while no value is entered in the passcode input display. After forcibly resetting, reset the passcode according to "Passcode" P.53.

Error details	Cause	Action
The measurement value is not displayed.	Connector for SC-U-EB is not properly connected.	Turn off power, check the connector, and refer to "Sensor Input/Output Expansion Board SC-U-EB Instruction Manual", "4. Installation" to wire the cable properly.
	A computer is connected.	Measurement and output cannot be performed while the product is connected to a computer. Cut the connection with the computer.
	The sensor cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The sensor cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The sensor is out of order.	The sensor must be repaired. Contact the dealer.
The connection status **GW** is not displayed. Data is not visible in the cloud.	The gateway is not connected.	To send data to the cloud server, the gateway must be connected to the transmitter. Connect the gateway.
	The cable is not properly wired to the transmitter.	Turn off power of the transmitter and the gateway, check the wiring, and be sure to wire properly.
	The cable is not properly wired to the gateway.	Turn off power of the transmitter and the gateway, refer to the gateway's instruction manual to check the internal wiring of the gateway, and be sure to wire properly.
	The cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The power cable is not wired to the gateway.	Turn off power of the transmitter and the gateway, refer to the gateway's instruction manual to check the internal wiring of the gateway, and be sure to wire properly.
	Power of the gateway is OFF.	Follow the description of the gateway's instruction manual to turn on power.
	Breaker of the gateway has been activated.	Follow the description of the gateway's instruction manual.
	A computer is connected to the gateway.	Connection with the transmitter cannot be checked while being connected to a computer. Follow the description of the gateway's instruction manual.
	The gateway is uploading data to the cloud server	Connection with the transmitter cannot be checked during communications with the cloud server. Wait until the communication is completed.
	The gateway is under warm-up after power is turned ON.	Connection with the transmitter cannot be checked during warm-up. Wait until warm-up is completed.
	The gateway is out of order.	The gateway must be repaired. Contact the dealer.

Error details	Cause	Action
Data cannot be sent from the gateway.	The send channel setting is not complete.	Output to the gateway is not available unless transmission item to the transmission channel as well as the transmission interval have been set. Refer to "Send channel setting" P.28 to configure the setting.
	An error occurred in the gateway.	Follow the description of the gateway's instruction manual.
	The cloud settings are wrong.	Follow the Cloud Help for confirmation.
4-20 mA output is not available.	4-20 mA output setting has not be finished yet.	Refer to "5.3 4-20 mA Setting" P.30 to configure the setting.
	Connector for SC-U-EB is not properly connected.	Turn off power, check the connector, and refer to "Sensor Input/Output Expansion Board SC-U-EB Instruction Manual", "4. Installation" to wire the cable properly.
	The cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The transmitter is out of order.	The transmitter must be repaired. Contact the dealer.
Three or more 4-20 mA output channels cannot be connected.	SC-U-EB is not connected.	To connect two or more 4-20 mA output channels, SC-U-EB must be connected to the transmitter. Then up to four 4-20 mA output channels can be connected.
The 4-20 mA output is incorrect.	The measurement value is held.	When **HOLD** is displayed in the sensor status, the measurement value is retained. When the time set by the hold timer elapses, the setting is canceled. To cancel manually, refer to "Canceling measurement value hold" P.68 to cancel the hold.
	It is included in each menu.	If it is included in each menu, the measurement value is retained. When the measurement value display is returned, the hold of the measurement value is canceled.

Error details	Cause	Action
Relay output is not available.	The relay setting is not complete.	Refer to "5.4 Relay Setting" P.38 to configure the setting.
	Connector for SC-U-EB is not properly connected.	Turn off power, check the connector, and refer to "Sensor Input/Output Expansion Board SC-U-EB Instruction Manual", "4. Installation" to wire the cable properly.
	The cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
	The transmitter is out of order.	The transmitter must be repaired. Contact the dealer.
More than 4 channels of relay output cannot be connected.	SC-U-EB is not connected.	To provide five or more relay output channels, SC-U-EB must be connected to the transmitter. Relay output can be added up to eight channels.
The date is not displayed.	The gateway is not connected.	The date and time is displayed on the status bar when the gateway is connected.
A measurement value is not proper.	The measurement value hold is enabled.	If **HOLD** is displayed on the sensor status, the measurement value is retained. When the time specified by the hold timer passes, it is canceled. To manually cancel it, refer to "Measurement value hold" P.67.
	The measurement value hold is enabled while cleaning is being performed.	If **CLEAN** is displayed on the sensor status, cleaning is under way. The last measurement value is retained during cleaning. When cleaning is complete or post-cleaning standby passes, the measurement value hold is canceled.
	An item to measure is not set as a display item.	The item to measure must be set to either main, 2nd, or 3rd display. Refer to "Display Item" P.22 to configure the setting.
	The sensor is not clean.	Follow the description of the sensor's instruction manual, "Maintenance".
	The sensor is out of order.	The sensor must be repaired. Contact the dealer.

Error details	Cause	Action
The maintenance timer output is not made from the relay.	Maintenance output has not been assigned to the relay output.	The notification by the maintenance timer is available if the maintenance output has been set using relay output. Refer to "Maintenance output setting" P.46 to configure the setting.
	The cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.
Manual cleaning of a sensor with wiper cannot be performed.	A sensor to perform manual cleaning is not selected.	Refer to "Manual Cleaning" P.74 to select a sensor to perform manual cleaning.
	The sensor is out of order.	The sensor must be repaired. Contact the dealer.
The cleaning device cannot be activated.	Cleaning output has not been assigned to the relay output.	The cleaning device can be activated only if the cleaning output has been set using relay output. Refer to "Cleaning output setting" P.47 to configure the setting.
	Cleaning interval (Relay) is OFF.	When the cleaning interval (Relay) is OFF, the cleaning device does not operate. Refer to "Cleaning Interval (Relay)" P.76 to configure the operating time of the cleaning device.
	The cable is not properly wired.	Turn off power, check the wiring, and be sure to wire properly.
	The cable is broken.	Make sure that the cable is not damaged. If any damage is found, contact the dealer.

12 Maintenance

Maintenance (Monthly)

Perform the following items every month.

- Inspect the installation bracket for corrosion.
- Inspect the cover and operation panel for dirt.
  Use a clean and soft cloth for cleaning. Remove dirt with diluted mild detergent, and use a
  dry cloth to wipe dry.

  Do not use organic solvent for cleaning.
  Otherwise deformation or malfunction may occur.

Periodic Inspection (Every 3 Months)

Check the following items every 3 months.

- SC-U1 is tightly fixed.
- SC-U1 is not out of order without any damage.
- Terminal block screws are not rusted.

Long-Term Storage

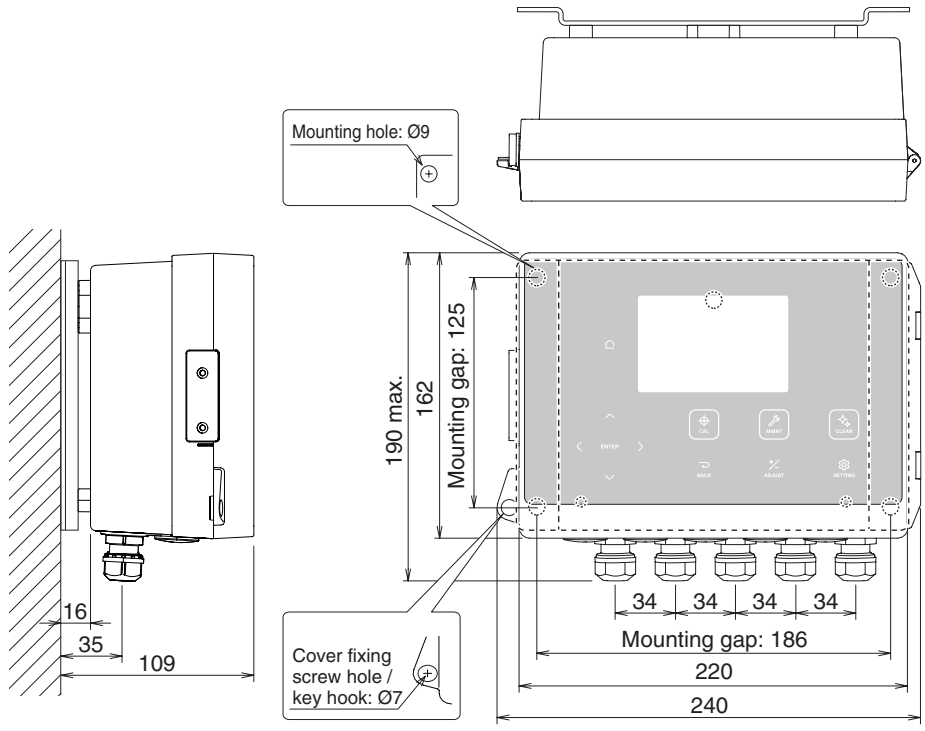If the SC-U1 is not used over a prolonged period, keep it as follows:

1. Turn OFF the power switch and disconnect the power cable.
2. Store the SC-U1 away from direct sunlight.

13 Specifications

Name	Universal Transmitter
Model	SC-U1(E)
Power supply voltage	100-240 VAC ±10% 50/60 Hz
Power consumption	1 sensor installed: 20 VA max. (normal), up to 35 VA 2 sensors installed: 25 VA max. (normal), up to 40 VA 4 sensors installed (using SC-U-EB): 30 VA max. (normal), up to 50 VA (analog signal output 20 mA)
Output	Signal output: 2 channels Using SC-U-EB: 4 channels 4-20 mA (resistance load 600 Ω max.)
	Relay output: 4 channels Using SC-U-EB: 8 channels Non-voltage C contact (Capacity: 240 VAC, 1 A resistance load)
Input	Sensor: 2 channels Using SC-U-EB: 4 channels
	Gateway: 1 channel
Ambient operating temperature	-20 to 50°C, Humidity 95%Rh or less (Avoid direct sunlight)
Main material	Polycarbonate
Dimensions	Approx. 162 (H) x 240 (W) x 109 (D) mm
Weight	Approx. 1.8 kg (including mounting bracket)
Degree of protection	Water jet proof type (IP65)
Installation environment	Indoor specifications
Altitude	2,000 m max. above sea level
Overvoltage category	2
Pollution degree	2
Option	Sensor input/output expansion board: SC-U-EB, Gateway, Hood kit: TP-FK2, Pole stanchion: PS-1, Pole stanchion fixing bracket: PS-TK

Specifications are subject to change without notice.

14 External Dimensions

Mounting hole: Ø9

Cover fixing screw hole / key hook: Ø7

190 max.
162
Mounting gap: 125

16
35
109

34 34 34 34
Mounting gap: 186
220
240

(Unit: mm)